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# GROUND WATER PROGRAMS IN THE STATE OF NEW JERSEY

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# HEARING

BEFORE THE

SUBCOMMITTEE ON WATER AND POWER

OF THE

COMMITTEE ON

ENERGY AND NATURAL RESOURCES

UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

FIRST SESSION

CONCERNING GROUND WATER RESOURCES AND RELATED MANAGEMENT AND REGULATORY ACTIVITIES IN THE STATE OF NEW JERSEY

BURLINGTON, NJ, SEPTEMBER 14, 1987

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# GROUND WATER PROGRAMS IN THE STATE OF NEW JERSEY

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## MONDAY, SEPTEMBER 14, 1987

U.S. SENATE,
SUBCOMMITTEE ON WATER AND POWER,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
*Burlington, NJ.*

The subcommittee met, pursuant to notice, at 11:10 a.m., in Burlington, NJ, Hon. Bill Bradley, presiding.

### OPENING STATEMENT OF HON. BILL BRADLEY, A U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator BRADLEY. The Subcommittee on Water and Power will come to order.

Before I begin with an opening statement, I would like to just take care of some housekeeping matters. First, I would like to express my appreciation to Mayor Herman Costello and to Dan Keegan for making this room available, and also to Tom Foy for the welcoming.

Also, a sign-up sheet is on the table next to the door, if you would like to receive a copy of this morning's hearing record.

The record will remain open for 2 weeks for submission of additional materials. Anyone who would like to submit, amplify, clarify, or add to the hearing record can do so simply by mailing those comments to the Committee on Energy and Natural Resources, Subcommittee on Water and Power, Senate Dirksen Building 358, Washington, DC, 20510.

This is the third hearing held by the Subcommittee on Water and Power on the topic of ground water supply quality and quantity.

Thus far, our perspective has been national, with testimony from the principal Federal agencies—the U.S.G.S., the U.S. Geological Survey, and the Environmental Protection Agency, and from a variety of States, industrial organizations, and national environmental groups.

Today our goal is to see these issues as they relate to, in very real terms, the people of New Jersey. We will look at the impact of State programs on ground water supply and quality, and we will try to assess the contribution of the Federal programs to the maintenance of New Jersey's ground water. As we conduct the hearing, we will try to answer three questions:

First, what is New Jersey's ground water strategy, and how does the Federal Government contribute?

Second, how effective will this strategy be in safeguarding future water supplies for the State?

Third, what can be done, if anything, to improve the Federal role in this strategy?

Ground water is essential to New Jerseyans and to the State's economy. Eighty-five percent of all residents of South Jersey get their drinking water from ground water sources. South Jersey also uses ground water for irrigating its farms and for its industries.

While ground water supplies fewer homes and industries in North Jersey, it still accounts for 40 percent of the State's water supplies. Without adequate, safe ground water supplies, it is quite clear that New Jersey is in trouble.

In terms of the resource, I think we will see today that New Jersey enjoys almost an embarrassment of riches. For instance, New Jersey's coastal plain and the aquifers there provide nearly 500 million gallons per day to users, and the recharge rate for the aquifer is 5 billion gallons per day—10 times current levels of consumption.

The amount of water now stored in the aquifer in the coastal plain aquifers is estimated at 85 to 170 trillion gallons—in other words, a couple of hundred years of supply at today's rates of demand.

Now, if we were talking about oil resources, we could all sleep soundly at night, content with this rich abundance. But the fact of the matter is, ground water is not like oil.

We drink ground water, and even slight contamination, at levels on the order of a few parts per billion, can render water unfit for our consumption.

Inadvertent human action can place our abundance, our riches, in jeopardy. But with vigilance, care, and planning, we can safeguard these resources for the growth and prosperity of New Jerseyans now and into the future.

In the previous subcommittee hearings, we have heard testimony from a variety of experts. The testimony we have received suggests some preliminary conclusions:

First, while we are not in a crisis situation, the choices we make today will determine whether ground water will be available for our future, and our children's future. Like New Jersey, much of the nation depends on ground water supplies.

Nationally, over 120 million people, and 90 percent of rural Americans rely on ground water. The absence of adequate planning will place our future in jeopardy, and we simply can't allow that to happen.

Second, prevention of contamination is the key element in protecting ground water resources for the future. Unfortunately, we know from experience the extreme cost and near impossibility of cleaning them up once they have been contaminated.

While the vast amount of New Jersey ground water remains pure, there is the growing concern over contamination. Over 1000 wells in the State have been closed, probably forever. We can't afford to pollute our ground water today; the price we would have to pay tomorrow would simply be too great.

Finally, we need to augment and restructure Federal research and data gathering programs in order to provide the information decision makers need to prevent contamination from crippling our ground water supply and our future.

New Jersey has been fortunate to benefit from a 60-year partnership with the U.S. Geological Survey and has committed substantial funding to ground water resource planning.

Nevertheless, both here and in other States, too little is known about this vital resource. Too many questions remain.

I look forward to today's testimony. I am committed to protecting our ground water resources, and I am certain that today's witnesses, with insights gleaned from a day-to-day involvement in New Jersey ground water and its problems, will be extremely influential as we try in Congress to forge a consensus on what needs to be done.

So, let's begin. The first witness is Mr. Donald Vaupel, District Chief of the U.S. Geological Survey, West Trenton, NJ.

Welcome to the subcommittee, and you might identify the individuals who are accompanying you.

## STATEMENT OF DONALD E. VAUPEL, CHIEF, NEW JERSEY DISTRICT, U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR, ACCOMPANIED BY PATRICK LEAHY AND MARK AYERS, ASSISTANT DISTRICT CHIEFS

Mr. VAUPEL. Mr. Chairman, my name is Don Vaupel, and I am chief of the New Jersey District of the U.S. Geological Survey.

Before I proceed, I would like to identify the two gentlemen with me. They are the assistant district chiefs in my office.

On my immediate left is Pat Leahy, in charge of research in our district, and on my far left is Mark Ayers, who is in charge of our data assessment program and information program.

Senator BRADLEY. Mr. Ayers is going to handle the maps?

Mr. VAUPEL. Yes. It is a pleasure to be here to comment on the technical activities of the U.S.G.S., and to describe our water resources program in New Jersey, with an emphasis on ground water and ground water quality.

The U.S.G.S. is the principal source of scientific and technical expertise in the earth sciences, within the Department of the Interior and the Federal Government.

The primary mission of the U.S.G.S. is to assess the quantity and quality of the Nation's water resources, and over one-third of the U.S.G.S.'s resources are dedicated to this.

In total, the New Jersey program receives $6 million which supports over 100 scientists and support staff, describing and analyzing the water resources of the State.

Nearly $2.5 million of the money is supplied by the New Jersey Department of Environmental Protection, and 16 other counties and townships in a cooperative effort to collect and analyze the data.

The board displayed on the left indicates the list of our cooperative agencies—The New Jersey Department of Environmental Protection is listed first, and has the primary responsibility of regulating the water resources.

They have contributed $2.1 million to our program in 1987. Other Federal agencies also currently provide about $1 million to investigate specific water resources problems within their jurisdiction.

The New Jersey District is similar to the U.S.G.S. offices throughout the Nation in each State or small groups of States. There are over 250 field offices currently investigating water resources throughout the country.

Basically two questions need to be answered when water managers attempt to develop policies to manage the water resources of the State. They are the quantity of the water available and the quality of the resource. The second board indicates the type of information that the U.S.G.S. provides to water managers.

We provide real time information on flood warning networks. We provide surface water and groundwater availability, and quality assessments. We construct and develop models to predict future impacts on water resources. We collect hydrologic information, part of which is water use information. In order to provide the data needed, the New Jersey District has monitored numerous hydrologic parameters for several decades.

The most extensive of these networks is the streamflow monitoring network on the left-hand map, water quality monitoring, whose sites are indicated in the center, and the measurement of water levels and chlorides at the sites on the right-hand map.

These monitoring stations are long-term, and track long-term, trends in quantity and quality. More recently we have begun to collect areal data for a specific drainage basin at one point in time.

These snapshots provide data needed to calibrate and verify hydrologic models which are used for predicting the effects of pumpage and other impacts placed upon the hydrologic system.

The area shown in blue on the map is the Rockaway River basin, which is one of the areas that has been studied in this manner.

At this point, I would like to submit the rest of my written testimony for the record and to discuss with you, Senator, a few illustrations that describe ground water resources in the State, and some of the problems facing water managers.

Senator **Bradley**. Your full testimony will be inserted into the record.

[The prepared statement of Mr. Vaupel follows:]

-Statement of Donald E. Vaupel
Chief, New Jersey District, U.S. Geological Survey
before the Subcommittee on Water and Power
of the Committee on Energy and Natural Resources, United States Senate
September 14, 1987

Mr. Chairman, members of the Committee, my name is Don Vaupel and I am Chief of the New Jersey District of the U.S. Geological Survey (USGS). It is a pleasure to be here today to comment on the technical activities of the USGS and to describe our water-resources program in New Jersey, with an emphasis on ground water and ground-water quality.

The USGS is the principal source of scientific and technical expertise in the earth sciences within the Department of the Interior and the Federal Government. A primary mission of the USGS is to assess the Nation's water resources, and about one third of the Geological Survey's total program is devoted to this purpose.

The hydrologic setting for New Jersey's ground water is defined by four major physiographic provinces - Valley and Ridge, Highlands, Piedmont, and Coastal Plain. The Valley and Ridge, Highland and Piedmont provinces can be further subdivided into glaciated and unglaciated, inasmuch as the last glacial advance covered about half of northern New Jersey. The Coastal Plain has topographic, geologic, and hydrologic characteristics that are markedly different from the northern three provinces and is the largest physiographic province in New Jersey. It comprises the entire area southeast of the Piedmont province. The geology of the Coastal Plain is characterized by unconsolidated sand, gravel, silt, and clay thickening seaward from a featheredge near Trenton to more than 6,500 feet thick in southern Cape May County.

The principal aquifers of New Jersey are classified into two groups--coastal plain aquifers and non-coastal plain aquifers. The five principal coastal plain aquifers are the Kirkwood-Cohansey aquifer system, the Atlantic City 800-foot sand, the Wenonah-Mount Laurel aquifer, the Englishtown aquifer, and the Potomac-Raritan-Magothy aquifer system. All but the Kirkwood-Cohansey are confined except where they crop out or are overlain by permeable surficial deposits. The aquifers are recharged directly by precipitation in outcrop areas and by vertical leakage through confining beds. As much as 90 percent of the discharge of Coastal Plain streams is derived from the ground-water system.

Ground water is used extensively throughout New Jersey for public, industrial, domestic, and agricultural supply. Nearly 3.5 million people (45 percent of New Jersey's population) depend on ground water. In 1985, about 630 Mgal/d of freshwater was pumped from aquifers in the State. However, areal and seasonal variations in ground-water withdrawals can be significant. In the Coastal Plain, 85 percent of the freshwater supply is from ground water. High capacity production wells used for public supply commonly yield 500 to 1,000 gallons per minute (gal/min), and many exceed 1,000 gal/min. Water quality is satisfactory except for local excessive iron concentrations and local contamination from saltwater intrusion and waste disposal. In the unconfined Kirkwood-Cohansey aquifer system, water is brackish or salty in some coastal areas. In confined aquifers, salinity generally increases with depth in the southern and southeastern parts of the Coastal Plain.

The principal non-coastal plain aquifers include the glacial valley-fill aquifers, the Piedmont aquifers, the carbonate aquifers within the Valley and Ridge sedimentary rocks, and the igneous and metamorphic crystalline rocks of the Highlands crystalline units.

Stratified drift and till underlie valleys north of the limit of glaciation. The stratified drift, consisting of poorly sorted sand and gravel forms the glacial valley-fill aquifers. The aquifers generally are not more than 30 to 40 feet thick. However, occasionally aquifers may be up to 300 feet thick. Glacial valley-fill aquifers are the most productive source of ground water in some northeastern counties in New Jersey. These aquifers may yield as much as 2,000 gal/min to public supply and industrial wells.

Aquifers present in the Piedmont physiographic province, consist of shale and sandstone. Water generally is present in weathered joint and fracture systems in the upper 200 to 300 feet. Below a depth of 300 feet, fractures are fewer and smaller, and water availability is reduced. In coarse-grained sandstones, ground water also is present in intergranular pore spaces. In several counties, the shale and sandstone aquifers are the most productive and yield as much as 1,500 gal/min.

In the Valley and Ridge sedimentary units, the most productive aquifers are carbonate rocks that commonly yield large supplies of water, especially where overlain by stratified glacial deposits. Cavities and solution channels in the rock provide storage and avenues for water movement. In the crystalline highlands, water is available in weathered and fractured zones, usually within 300 feet of the land surface.

Non-Coastal Plain aquifers generally yield water of satisfactory quality but are susceptible to local contamination because of their proximity to the land surface.

Since the 1900's, ground-water withdrawals have increased in New Jersey and have resulted in regional declines in water levels in several aquifers. Many water-supply problems associated with the increase in ground-water withdrawals have been documented. These problems include declining ground-water levels in confined aquifers which induce movement of brackish or saline water from surface-water bodies or adjacent aquifers.

Conditions or changes in the hydrologic system may result in water-quality problems. Natural conditions or changes include changes in precipitation over time, saltwater intrusion due to long-term climatic changes associated with sea level changes, and the occurrence of geologic materials that can be a source of undesirable water-quality constituents. Human-induced changes include saltwater intrusion caused by withdrawals, improper disposal of contaminants, urban and agricultural drainage, and atmospheric deposition. Since 1970, about 1,400 wells in the State have been closed because of both natural and man-caused contamination.

In New Jersey, the U.S. Geological Survey has had a cooperative program with state and local agencies since the late 1920's. During that time, the program orientation has undergone several changes as the needs of water managers has changed. Through the 1950's, we concentrated on fixed station monitoring and an inventory of water supply. During the 1960's, the majority of studies were related to "systems analyses" commonly called the water budget, where the interest was determining "water in/water out" answers. In the 1970's, we developed procedures to simulate ground-water flow through the use of computer models and in the 1980's we have added capabilities to the models to examine process mechanisms that account for changes in water quality within the hydrologic regime.

In 1987, the New Jersey program exceeded 6 million dollars and supported over 100 scientists and support staff describing and analyzing the water resources of the State. Of that amount, nearly 2.1 million dollars is provided by the New Jersey Department of Environmental Protection which has used the mandate of the New Jersey Water Supply Master Plan to begin a massive effort to update the hydrologic data base in areas where critical water-supply problems exist. To date, investigations have begun in three areas of the Coastal Plain - Atlantic City, Camden, and South River. These extensive efforts were budgeted at total of $7.5 million over five years from 1984-1988. This funding was even further expanded by $600,000 to drill two offshore monitoring wells to determine the extent of confined freshwater under the Atlantic Ocean.

Other major cooperative efforts include the development of rainfall/runoff models with Somerset County the optimization of ground-water withdrawal patterns to prevent salt-water intrusion with Cape May County and a description of the movement and fate of hazardous waste in the shallow ground- water systems in Logan and Greenwich Townships, both of which are located in Gloucester County.

The major program thrusts in the New Jersey District can be broken into two categories, monitoring programs, which collect hydrologic and related data, and analyses programs that use the data to describe the occurrence, distribution, and movement of water and constituents within the hydrologic cycle. The largest of the monitoring programs is the streamflow and lake stage monitoring network where the New Jersey District operates 100 continuous streamflow stations throughout the State of New Jersey to provide the long-term data needed when interpretive hydrologic studies are conducted. The Geological Survey also operates a large streamflow water quality network dedicated to monitoring water quality trends in key streams and wells throughout the state. This information is shared with the Environmental Protection Agency. Two other very important statewide monitoring networks include the periodic water level and chloride (salinity) measurements in wells throughout New Jersey to describe trends in water levels and increasing chlorides.

More recently, a cooperative program to monitor and collect data related to ground-water use throughout the state has begun. These data are needed for hydrologic simulation modeling and for water budget analyses.

The hydrologic analyses programs of the New Jersey District can be broken into two areas, resource assessment, and definition of hydrologic processes. The three largest assessment studies presently being conducted are designed to collect and interpret hydrologic data on three critical areas near Atlantic City, Camden, and South River, where questions concerning water supply will influence future decisions concerning development. These three studies encompass several new ideas in the collection and analyses of hydrologic data, including: 1) offshore drilling to locate the salt/freshwater interface 2) surface geophysics to define the geohydrologic framework and areas of ground water contamination and 3) computer techniques to analyze and display hydrologic data. Preliminary data of these three investigations indicate a freshwater body offshore of Atlantic City, the induced infiltration of Delaware River water into the aquifer system near Camden caused by pumping, and the encroachment of saltwater into the Keyport Union Beach area. Other resource assessment studies are being conducted in the Passaic River valley, the Rockaway River basin, and in northern Mercer County.

The other major effort of the USGS program is the study of hydrologic processes. Included are studies investigating the effects of acid rain on shallow ground water with emphasis on the mobilization of metals, further examination of the variability of corrosivity of the shallow ground water on the Coastal Plain, and a study investigating the movement of naturally occurring radioactive isotopes into well water in the Piedmont physiographic province. Cooperative efforts with Logan and Greenwich Townships in Gloucester County are investigating the migration of contaminant plumes and associated geochemical processes. In addition, cooperative investigations with Cape May County are determining schemes to optimize pumping to prevent saltwater intrusion.

Thank you, Mr. Chairman, this concludes my prepared statement, and I would be happy to answer any questions you may have.

Mr. VAUPEL. To properly understand the potential of the groundwater resource base of the State, we must understand where the water comes from, how it resides, and where it goes.

New Jersey's ground water resources are derived from the precipitation which falls upon the State. On the average, precipitation is about 45 inches and provides New Jersey with an ample water supply.

Part of the precipitation runs across the land surface directly into streams and discharges into the sea. Another portion is immediately evaporated or transpired by plants and returns to the atmosphere.

The remainder infiltrates the soil zone, and percolates downward until it enters the groundwater body. Once it enters the ground water body, it is stored within spaces that occur in the geologic units.

I would like to now draw your attention to the hydrogeologic map that is currently displayed. Parts of four major physiographic provinces are located in New Jersey.

In the north, we have the Valley and Ridge province, the Highlands province, and the Piedmont province. The aquifers in this area are made up of consolidated rock, overlaid by valley filled materials.

The valley filled materials are especially important north of the southern extent of the glaciated area, which is shown by the dashed line on the northern part of the map.

In southern New Jersey, there is a large, wedge-shaped body of unconsolidated deposits that thickens to the southeast.

These two major hydrogeologic units are separated by the fall line, which extends through the entire eastern United States and separates the consolidated rock units to the west from the unconsolidated deposits of the coastal plain to the east.

That is shown by our cross-section AA-prime through Camden and essentially Atlantic City. The coastal plain is made up of a series of interbedded sand, gravel, clay, and silt units.

These hydrogeologic units provide the framework for two distinct types of aquifer systems, commonly called unconfined, or water table aquifers, and confined, or artesian aquifers.

The unconfined aquifers are the uppermost aquifers in the system. They receive recharge directly from the land surface, and discharge the majority of their water to streams flowing through the area.

The unconfined aquifers of the coastal plain are potentially more productive than the deeper aquifers.

Senator BRADLEY. Now in this drawing, Camden would be A, and A prime is Atlantic City?

Mr. VAUPEL. That is right. However, these unconfined aquifers are also more susceptible to contamination from the land surface.

And use of these aquifers can reduce the flow of streams that the aquifers discharge into, thereby threatening fragile ecological systems.

Below the first impermeable unit of silt, or clay, the remaining sand and gravel aquifers become confined. These aquifers obtain their water either from leakage to the confined unit, or from an area where they outcrop to the surface.

The confined units of the coastal plain outcrop in parallel bends southwest/northeast. These aquifers are currently the most heavily used. Withdrawals from these aquifers do not directly affect the streams above them, and they are also less susceptible to contamination from the land surface.

However, each of these confined aquifers, when projected eastward, is in contact with the saltwater beneath the Atlantic Ocean and therefore, large pumpage rates can cause saltage intrusion to move westward into areas that are currently being pumped.

I would like to draw your attention to the small confined units shown in the cross-section near the eastward extent of the diagram. This is the aquifer commonly known as "the 800-foot sand," from which Atlantic City obtains a major part of its water supply.

We will discuss this aquifer in greater detail later on.

Senator BRADLEY. Can you point to that again?

[Witness pointed.]

Mr. VAUPEL. North of the fall line, water occurs in fractures and solution cavities of consolidated bedrock, or in the valley filled deposits left by the last advancing glaciers, approximately 15,000 years ago.

The valley filled aquifers are the most productive of this region. However, they are small in extent, and provide only limited storage of ground water.

The bedrock aquifers are generally less productive. However, their capability to produce water varies considerably from place to place, depending on the composition of the rock units and the amount of fracturing present.

I wish to draw your attention to the Piedmont province, which is the green. This will be discussed later in relation to water quality.

Once we have an understanding of the occurrence and movement of groundwater under natural conditions, it is necessary to predict the effects of conditions or changes placed on hydrogeologic systems.

These conditions or changes can be natural, or they can be man-induced. Natural changes include the changes in the amount of recharge due to variations in precipitation, saltwater intrusion due to long-term climatic and associated sea-level changes, and the occurrence of geologic materials that are a source of undesirable water-quality constituents.

Human-induced changes include increased water use, disposal of sewage and other contaminants, and the increase of acidic atmospheric deposition.

Now, the next two boards will illustrate some of the changes and their effects on the hydrogeologic system. Because of heavy use of ground water throughout the State, which supplies 45 percent of the population statewide and 85 percent on the coastal plain, probably the largest effect on the hydrologic system is related to pumping centers, and the lowering of ground water levels.

As we can see, large pumping centers shown here in the green circles have caused regional ground water declines, forming large cones of depression—the yellow areas—in the confined aquifers of the coastal plain. Although cones of depression in themselves do not constitute a problem, when they become large enough to affect regional patterns of ground water flow they can create the movement of salt water into the aquifer system, as is happening in the Keyport-Union Beach area.

Or, they induce infiltration from associated surface water bodies such as the Delaware River near Camden. The New Jersey Department of Environmental Protection is currently taking steps to reduce pumpage in certain aquifers to reduce the size of the associated cones of depressions.

One area of concern is the major confined unit, referred to as "the 800-foot sand", which supplies Atlantic City with a significant portion of its public water supply.

This unit is currently under investigation, and the board display indicates some recent data. It has been known for years that ground water withdrawals are depressing the water levels in the aquifer.

By measuring water levels in many existing wells, it is possible to draw the configuration of the cone of depression. The black lines on the diagram are the interpretation of lines of equal levels within the aquifer. In addition, water samples were obtained to determine the salt content of the water.

This can be calculated by measuring the electrical conductivity of the water, because an increase in salt increases the conductivity in a corresponding fashion.

However, because the greatest pumpage in the aquifer was occurring at or near the shoreline, in Atlantic City, onshore measurements can only reflect half the picture, and it was impossible to determine the extent of fresh water off shore.

In 1985, in cooperation with the New Jersey Department of Environmental Protection, the U.S.G.S. drilled two wells 2 and 5 miles offshore to determine the extent of fresh water extending underneath the Atlantic Ocean.

As you can see, the first well had a conductivity similar to those found onshore, while the well 5 miles off shore had an elevated level of conductivity, which probably indicates it is in the zone of diffusion between fresh and saltwater.

Senator Bradley. And how deep were the wells?

Mr. Vaupel. The wells at that point were about 1,200 to 1,300 feet deep, because that is how deep the aquifer is at that particular point.

Senator Bradley. So your cross-section extended out under the saltwater?

Mr. Vaupel. That is right. It is underneath the ocean, and there is still a bubble of fresh water that exists underneath the ocean.

In this environment, the history of that fresh water is probably related to the lowering of sea level during the time of advance of the glaciers.

From this very important data, it is possible to more closely estimate the size of the fresh-water body that supplies Atlantic City.

It is interesting to note that water levels measured in those offshore wells were within 10 feet of water levels predicted by hydrologic models, developed before this information was available.

In addition to the physical changes caused by ground water withdrawals, the ground water body is subject to chemical impacts. For example, acidic atmospheric deposition can release metals from soils, which in turn can cause severe ecological damage.

Because of its chemical composition, the material of the coastal plain is especially susceptible to degradation of shallow ground water due to acid rain.

This is because there is a lack of chemicals needed to buffer the system, and neutralize the acidity. And we don't mean to indicate by this map that no other part of New Jersey is susceptible to acid rain.

This is just the most susceptible.

Senator BRADLEY. And once again, why is the coastal plain most susceptible?

Mr. VAUPEL. Because its natural composition, the chemical composition of the material does not have the necessary constituents, basically calcium, to buffer the acid and make it neutral—neutralize it—so the water stays acidic and therefore it can do harm to the environment.

Mr. Chairman, you have already addressed the problem of leaching of lead from plumbing in houses that are obtaining their water supply from shallow ground water systems that show these characteristics. We have oriented our studies to determine the degree and variability of corrosivity in the shallow ground water of the coastal plain by using a corrosive index, which is determined by geochemical calculations based upon chemical analysis of ground water.

We are attempting to determine the areas where and the reasons why groundwater exhibits increased corrosivity. In a small pilot study in Ocean County the calculation of this index has produced areas of varying corrosivity. It is interesting to note that one of the areas of highest corrosivity shown in dark red is in the Berkeley-Beachwood area, where the lead problem in drinking water was first discovered. We have also noted certain areas that tend toward the mobilization of aluminum which can be toxic to fish.

Senator BRADLEY. So that in the exact place where we had the problem a few years ago of lead in the drinking water because of the lead in the pipes you have determined is also the area of the highest corrosivity?

Mr. VAUPEL. Right. That is a terrible word, isn't it. Yes, the darkest red in that one, that little circle up there is in the Berkeley-Beachwood areas.

Senator BRADLEY. And that corrosivity comes from what?

Mr. VAUPEL. From both natural and man-made acidity.

Senator BRADLEY. Acid rain?

Mr. VAUPEL. Absolutely. The constituents that make up the chemical composition of where the shallow ground water is.

Senator BRADLEY. And why would they differ so much in the area that is viewed?

Mr. VAUPEL. Well, for instance, if you had an area of swamps, you might have a lot of natural organic acids in them. Actually we are trying to now determine what might be associated with those different corrosivity levels.

The next board turns to the northern part of the State north of the fall line, where the occurrence of natural radioactive minerals has been defined by geophysical techniques. This map is the piedmont province which we showed you on the earlier geologic map.

Senator BRADLEY. The piedmont province basically goes from Trenton roughly to the Palisades?

Mr. VAUPEL. Yes. It is the green area shown on this map.

In some of the geologic units in this area the occurrence of natural radioactive minerals in ground water has been defined if the proper environment exists, which includes fractures allowing ground water to come into contact with these deposits. Radioactive minerals can dissolve into the ground water and be brought to the surface by pumping wells. One by-product of these natural occurring minerals is radon gas, which has been documented as being a severe health problem in certain areas of New Jersey and Pennsylvania. By uncovering the geochemical processes by which these radioactive minerals enter the water and are discharged to the surface, water managers will be able to determine the locality and the severity of these problems.

You will notice that, in our investigation, the highest radioactive levels are found in close proximity to the contact between the Locketon and the Passaic geologic formations and locally in the Stockton formation. Similar occurrences of radioactive minerals have been defined in the Highlands physiographic province. The USGS, in cooperation with the New Jersey Geological Survey, is continuing to build its understanding of the distribution of uranium and natural radioactive materials in New Jersey and has expanded its efforts in understanding the geology and geochemistry.

Senator BRADLEY. So you are saying that where there are red dots there is a high level of radioactivity, natural radioactivity found in the water?

Mr. VAUPEL. In the water, that is right.

Senator BRADLEY. And how deep are the wells?

Mr. VAUPEL. Each one of those red and yellow spots and even the white ones are different wells and they are different depths. Some of the occurrences occurred very shallow.

Senator BRADLEY. What would that be?

Mr. VAUPEL. 20 feet, 30 feet, 40 feet, and some are fairly deep, 200, 300 feet.

Senator BRADLEY. Do you mean you find water 20 or 30 feet?

Mr. VAUPEL. Oh yes. In certain areas the water table is less than 20 or 30 feet.

Senator BRADLEY. Even in those formations?

Mr. VAUPEL. Yes.

Senator BRADLEY. And what is the deepest?

Mr. VAUPEL. I would think the deepest of these wells is 200 to 300 feet.

Senator BRADLEY. And you are in the process of a continued role monitoring of this?

Mr. VAUPEL. Yes. In fact it has been expanded recently. The U.S. Geological Survey is expanding its look into the natural radioactivity, in cooperation with the New Jersey Geological Survey.

Perhaps the most significant problem facing water managers is the disposal of hazardous waste. A recent list of the New Jersey Department of Environmental Protection contained over 1,100 hazardous waste sites located within the State. More than 100 of these are listed in the Superfund list of the U.S. Environmental Protection Agency, shown here in the red dots, and another 200 sites are being investigated under the RCRA program, which are the sort of brownish dots.

Senator **Bradley**. I do not know if it is my eyes, but red, I see red. And the brown, I see brown, okay. And then what are the ones that are camouflaged?

Mr. **Vaupel**. The greenish dots are sites identified by the State agencies. They are potential and active contamination sites.

Senator **Bradley**. And what is your role in the sites?

Mr. **Vaupel**. Our role is to investigate the movement of contaminants in certain specific areas to try and figure out the processes by which contaminants will move, occur and distribute, and what the fate of these is as they move down the pipeline. We don't study all of the sites, we pick a few and look at the processes that are occurring.

Senator **Bradley**. Could you give me one example and tell me what you have done and what you have found?

Mr. **Vaupel**. Yes. In the Picatinny Arsenal we are looking at a contaminant of TCE and trying to determine its rate of movement, how it moves through the particular aquifer, where it's discharged to, how long it stays within the system and things like that.

Senator **Bradley**. Now when you have a point source of pollution and you have a dump or a waste site, and you detect a plume, it is within the aquifer?

Mr. **Vaupel**. First, the contaminants must move down through the zone of aeration above the aquifer itself. But then once they hit the ground water, some of constituents will move with the ground water. Some are heavier than the ground water and sink to the bottom, some are lighter than ground water, like gasoline, and float on the top. So, there are several different processes by which these things are dispersed and eventually leave the system, and each of the individual comtaminants seems to have a different route.

Senator **Bradley**. Is the contaminant contained, or does it diffuse through the whole aquifer?

Mr. **Vaupel**. It diffuses, to a certain extent. However, plumes, generally speaking, do not contaminate a great deal. Individual plumes do not contaminate a great deal of the aquifer, and in fact the water resources of the State are really in fairly good shape, no matter what we hear.

Senator **Bradley**. So what you are saying is that when there is plume, it is like a black spot on a white background, right?

Mr. **Vaupel**. A very good description.

Senator **Bradley**. And it moves in a variety of ways. And the area outside the black spot is uncontaminated?

Mr. **Vaupel**. Uncontaminated, a very good analogy. This map shows the occurrence of hazardous waste sites as fairly widespread. It also indicates that there is a higher concentration in the corridor between Camden and Newark, which indicates the expected relationship to population density and land use. A portion of the waste sites are sanitary landfills. The next map shows that at least one landfill site is located within each county, and a total of more than 200 sanitary landfills sites exist in New Jersey. However, the majority of these are no longer active.

One effect of the hazardous waste disposal is the contamination of wells. The next map indicates the widespread closing of wells due to contamination. Since 1970 over 1,400 wells have been closed, and a vast majority of these wells, approximately 1,200 are private wells that show contamination from organic constitutents.

Senator **Bradley**. Should we draw a conclusion between the two maps?

Mr. **Vaupel**. Well, when you have a lot of waste contaminated sites you will eventually get a lot of well closings.

Senator **Bradley**. So that the higher the concentration of land fills, the greater the probability of contaminated wells?

Mr. **Vaupel**. Certainly, yes. I think you are safe in saying that. In the future I think the proper management of the water resources will require definition of natural conditions and human-induced changes placed upon the hydrologic system, the determination of the impact of these conditions, and the mitigations to the extent possible of the degradation of the resources in the environment.

Senator **Bradley**. What does that mean?

Mr. **Vaupel**. Whenever you do something to the hydrologic system you are going to get a result in the hydrologic system. What we have to do is determine what we want to live with.

When you hit the system with a stress of any kind you are going to get a reaction. So even though you only withdraw a cupful of water, the system reacts to that. What we have to do is determine what we can live with and what we want to live with, and manage our resources that way.

Senator **Bradley**. This is in terms of the amount of pumpage?

Mr. **Vaupel**. It's also in terms of the amount of chemical stress, because a chemical stress also has a certain reaction on the system. We must determine whether we want to live with a slight amount of pollution or a great amount and regulate and dispose of our contaminants accordingly. To understand exactly what these things are doing to the system, we must understand the physical, chemical and biological principles that govern the hydrologic system.

These are needed to define the system and understand the problems like the geometry of the freshwater bodies off shore or the distribution of corrosive ground waters. The understanding needed can only be accomplished through the continued acquisition and analysis of data which describes areal and temporal changes in the resource.

The USGS maintains an extensive monitoring system of hydrologic parameters. However, any attempt to predict the future impact on society would require additional data describing land use, population density and other cultural parameters that change over time. Although much has been done, there is still much to do to understand our water resources and the problems that they face.

I wish to thank you and the committee for allowing us to present this, and if there are any additional questions I would be happy to try and answer them.

Senator **Bradley**. Well I certainly appreciate your testimony Mr. Vaupel, and what I would like to do is, you enumerated a number of possible threats to the ground water supply, the encroachment of salt water, acid rain, land fill, waste, et cetera.

What would you say was the most significant and intense threat?

Mr. **Vaupel**. Pick one out of that?

Senator **Bradley**. That's right.

Mr. VAUPEL. I probably would have to say the disposal of contaminants right now is probably the single biggest threat that faces this State.

Senator BRADLEY. Contaminants?

Mr. VAUPEL. Yes. The disposal of material on the land surface and the contamination of the aquifer system from the top.

Senator BRADLEY. As you look prospectively, do you mean unless something is done?

Mr. VAUPEL. That to me is the biggest threat and I'm not trying to downplay the intrusion of salt water by withdrawing fresh water from aquifers, or overdrafting. But I still believe personally that the biggest threat will exist from pollution from the top, contamination from the top of the aquifer.

Senator BRADLEY. Would you say that your program in New Jersey is unique in terms of other states?

Mr. VAUPEL. No sir.

Senator BRADLEY. In other words, the USGS works with a lot of other States?

Mr. VAUPEL. And it has fairly similar programs throughout the country.

Senator BRADLEY. How does the program that you are working in New Jersey compare with say what you are doing in Pennsylvania or New York or Delaware?

Mr. VAUPEL. It only differs in the sense that the hydrologic environment differs in Delaware or in Maryland. It would be very similar on Long Island because they have the coastal plain and have a similar type of geology. In Pennsylvania, it is more geared to acid mine contamination from coal mines and that sort of thing. So whatever affects the hydrologic environment, you will see some differences.

Senator BRADLEY. Do you have a backlog of requests for projects that you would like to do in the State, or that the State would like you to do?

Mr. VAUPEL. Yes. We always seem to submit more proposals than we succeed in investigating.

Senator BRADLEY. Could you describe a couple and the costs?

Mr. VAUPEL. Well, we feel that probably some of the areas that we would like to expand our studies in would be in the northern part of the State. We have not done the overall hydrologic system studies that have been done on the coastal plain which has been studied over and over again for years and years, mainly because of the extensive ground water problems.

Our projects generally run between $100,000 and $200,000 a year for around 3 years, to look at a specific area, develop the necessary background data, and then do an analysis of that data to indicate what might happen if certain impacts and certain changes are put upon the hydrologic system.

Senator BRADLEY. So you would like to start, you would like to upgrade, you would like to have a similar kind of work as has been done in the coastal plain done in the highlands and piedmont area?

Mr. VAUPEL. We have started up there, but that is the area of the State which has the most necessity for additional work.

Senator BRADLEY. Thank you very much for your testimony. And let me thank you assistants for their presence here today.

Our next witnesses will be in the form of a panel with Richard Dewling, the commissioner of the New Jersey Department of Environmental Protection and he will be joined by Arthur Brown, Secretary of Agriculture, and Mr. Charles Kauffman, junior health officer of Ocean County Health Department.

Let me welcome all three of you to the committee, and now that we have heard from the scientific community, we look forward to your testimony.

I would hope that the witnesses would address the three questions that I asked at the beginning of the hearing in addition to their testimony. I would just remind you, what is New Jersey's ground water strategy and how can the Federal Government contribute to it, how effective will the strategy be in safeguarding the future water supply in the State, and what can be done if anything to improve the Federal role in this strategy?

But do not let me divert you from your original testimony during the course of the day so that the committee can have the benefit of your advice and counsel, and I hope you would address those areas.

Commissioner Dewling.

## STATEMENT OF RICHARD T. DEWLING, COMMISSIONER, NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

Mr. DEWLING. Mr. Chairman, thank you for the opportunity to be here this morning.

Let me say at the outset it is a tremendous thing to focus on probably what is almost comparable to the rate on problem ground water. When we had the drought, we had open defiance against our request for conservation because people could not see the problem.

And I think that is the same problem we face when you can see a reservoir that is going down, people react very positively to that. When they cannot see the problem, people do not react the same way and the blood does not boil as much.

There is no villain to point to, and so I really appreciate you bringing this to the attention of those of us in New Jersey. So let me just mention a couple of things, then I will submit for the record my full testimony. And I will be brief and try to in outline and answer some of the questions.

Senator BRADLEY. Your testimony will be placed in the record.

Mr. DEWLING. Thank you. Back in 1981, the State of New Jersey developed a water supply plan that looked at our long-range needs in the State.

And if one has to look at the ground water and surface water, 50 percent of our residents demand ground water supply and 50 percent surface water. In the northern end of the State, about 90 percent of our supply is surface supply, where we have all of our reservoir systems.

In the southern end of the State, about 90 percent is taken from the ground water. There is no question that, without the U.S.G.S. support, without that Federal assistance, that technical expertise and that type of capability, our program would not be at the advanced stage where it is today.

And I think it is important from several factors, you asked the question before the U.S.G.S. representative, which is the most serious potential ground water threat that we have. I think the key word there is residual waste.

That includes sewage sites, it includes hazardous waste, agricultural material, it includes the Superfund programs and probably the LUST Program, the Leaking Underground Storage Tank Program, which I think is very significant.

To give you some better perspective, and I will cheat and use some of the U.S.G.S. charts. Ten years ago we had 300 landfills in the State. Three hundred landfills that are now abandoned.

Of the 300 landfills we had 10 years ago, 10 today are active. And of the 10, 2 receive two-thirds of all the State's garbage. So what we are dealing with, and that is in Edgeborough, in Middlesex, and Hackensack.

Senator BRADLEY. Say those figures again?

Mr. DEWLING. Ten years ago 300 landfills existed in the State of New Jersey. Today, 10 exist. And of those 10, 2 receive two-thirds of all the garbage. And we produce about 10 million tons a year.

Now a question here is, just 3 days ago I presented to the Capital Budget Commission a proposal to address all these landfills that sit out there. Pretty much in the same vein as we set up with the environmental trust, that the Federal Government has gotten out of the business of providing grants to the States, who are now in the loan program within the State of New Jersey.

I suggested a $700 million loan program to assist the counties in defining the magnitude of the problems associated with these landfills that need to be maintained and need to be properly closed.

So it is without any question these type of landfills that sit out there. Now, these landfills, many of them do not receive hazardous waste as we define hazardous waste truckloads.

Normal household garbage contains hazardous chemicals. And you do get the migration of chemicals into the ground, because none of these landfills were built years ago with the technology we have today, which is the double-lined landfill. So that problem is real.

We also face the problem of residual waste. If we are going to have to dispose of sewage sludge, you know all of the problems we had this summer. The insulting situation with the hospital waste, the problems with the dolphins, the cries to take the sludge out of the ocean.

While the balance you have here, in meeting with Rutgers University and Mr. Brown, the Secretary of Agriculture, on some of these issues, the concern here is that if we keep applying sludge to the land, there is a potential for uptake in the food crop and then you also have the nitrate problem from ground water contamination.

So there is not this simple answer to residual waste, whether it be sludge dumping or whether it be normal application of some of these other materials that are from the normal processes.

So what we are dealing with here is we have the program in the State of New Jersey that is broken down in several ways. We have a prevention program, and we have the control and the correction program.

If I look at a prevention program, the biggest prevention program we have is known as ECRA, the Environmental Cleanup Responsibility. Since its beginning, I guess, in 1984, in 1983, we have had about 32,000 establishments go through the ECRA process.

Ten percent of them have had ground water contamination problems. This prevents ground water contamination. To give you an example, in the past 12 or 13 months, we have had almost $600 million in guaranteed financial assurance and cleanup of sites, compared to recovering $13 million from the Superfund.

Now what I am saying is, the balance here is that you are preventing the future Superfund sites, and there have been management problems.

Senator **BRADLEY**. You are saying that, under ECRA, when the property is transferred, they have to certify that they have taken care of the water supply problems?

Mr. **DEWLING**. That is right. Anything that is buried in tanks, vessels.

Senator **BRADLEY**. And you are saying that in the first 6 months of 1987, that there were corrective measures taken to the tune of $630 million?

Mr. **DEWLING**. In the past 18 months, we have had financial assurances, meaning private sector money is paying for it, close to about $600 million, $700 million.

I mean, one transfer of property that we had that involved a stock transfer gave us financial assurance of $60 million. You do not have to sell the property, you have stock transfers that are responsible under ECRA.

Senator **BRADLEY**. Is there a time period in which they are supposed to do this?

Mr. **DEWLING**. They have in time that notification to do something, they have got either a 5-day period or a 30-day period or a 60-day period.

I am just saying, when you decide to sell your piece of property, there is an SIC category, Standard Industrial Classification that you must fall under. Plus you must also meet other criteria relative to, you must be in the business of storing, handling, confining, or disposing of hazardous substances or hazardous waste.

And hazardous substances excludes sewage sludge. It excludes farms. But it includes, for example, commercial operation that would be selling fertilizers and pesticides.

Senator **BRADLEY**. I mean, how do you monitor this? How do you monitor that it is actually done?

Mr. **DEWLING**. We have site inspection beforehand and then we send a project officer to identify that the person will follow the project through to completion.

But the cleanup of the sites, do not let me mislead you. When I say the money is there, the site to clean up may take a year. But the financial assurance that you are not going to use Federal dollars or other dollars is there. The private sector dollars will be used.

The other program I think is equally important for prevention program. We have a water allocation permit program that says how much more, what are you going to take out of the ground?

Before it used to be limited to 100,000. Any time you took out more than 100,000 gallons per day, you needed a permit from us.

Now we are saying in critical areas, and the maps show the areas in Camden, up in Monmouth County, as the critical areas.

We are saying, if you are going to withdraw more than 10,000 gallons per day, you are going to need a permit from us. Plus, we are going to have to say to you, you have to reduce the depletion of that system by 45 percent or 50 percent and bring it back to its 1983 levels.

Now, that is critical because that is the critical areas, that is where the USGS showed you these drawdowns. Let me just add that General Whipple has probably forgotten more than I will ever know about water supply. Just to go through with you quickly in listing the critical areas.

General WHIPPLE. This program, I think, is unique. I do not believe any other state has one just like it.

The purpose of it is to deal with certain areas that the master plan indicated that we had greatly depleted groundwater drawn down, as described by Don Vaupel. And we have saltwater intrusion coming at the edge. That is how water intrusion comes directly from the sea.

But also in some cases it is connate salt water, laid down hundreds of thousands of years ago in areas that are south of here in Gloucester Country. And so this old sea water is coming in.

And the end result is, in each of the two water supply critical areas, we have pressure levels drawn down greatly below sea level.

And an intrusion of salt water. In order to do this under the Water Supply Management Act, we have the authority, we hold hearings, we have geological studies, hydrogeological studies first, in order to set the ground work, so we will know what we are doing when we outline the boundaries of a critical area.

This is a boundary for critical area number two, in which we are located at the present time, approximately up at Burlington. And in this entire area, the groundwater has been drawn down to at least 30 feet below sea level.

There is, of course, fresh water in most of this area. Most of the water being withdrawn here has been drawn in the northwest portion, with the center of the conical depression near Cherry Hill.

The salt water is here in this vicinity of Glassboro. And these areas have connate salt water that is now nearing the maximum that people should be allowed to drink. This water is bad for heart patients today and in the near future, if the trends continue, will be unacceptable drinking water for purposes entirely.

In this then we have decided that this entire aquifer has to reduce its withdrawals 35 percent below the 1983.

Senator BRADLEY. This is the PRM aquifer?

General WHIPPLE. Yes, the PRM aquifer, the lowest one. This applies to the municipal withdrawals, the industrial withdrawals, such as the new plant of DuPont, and even to the three or four, I think there are only three or four farmers in there to be concerned with. But they have to comply also, 35 percent reduction.

Now, in order to do this, we have to have an alternative source of water. The New Jersey Water Co. is prepared to spend up to $97 million to put in a water treatment plant, to take water from the Delaware and distribute it down through Camden, Burlington, and Gloucester Counties to the communities that need this.

Now, every community and every industry has the alternative of either taking water from this alternative source or going to some other source, some local source of water, such as a noncritical aquifer, such as a number of them are going to do down here.

That is why this pipeline is shown in green, the probability is they will be able to supply local wells. There will be something like between 40 and 50 million gallons a day will be required by the year 2020 in this auxiliary source that does not exist, that will originate not far from here.

It is not absolutely certain, of course, at this time that the water will actually be treated on the New Jersey side of the river, because it is a proposal from the city of Philadelphia to sell us that water from this surface capacity.

There are problems associated with this that I will not go into here. But it is yet undecided whether we will use the Philadelphia water, or whether we will treat water on the New Jersey side.

Senator **Bradley**. General, you never want to say that in a hearing. What problems? [Laughter.]

General **Whipple**. There are basically three problems involved. One is the water quality problem. The drinking water quality standards that we are setting up in New Jersey are very tight.

The indications are they are going to be tighter than the Federal standards are. And if this is the case, when they are set up for TEM, which are not set up for, either Federal or state to fill it up, the people have to treat all their water to meet New Jersey standards, will have to have supplementary treatment for the water to make it good enough for New Jersey.

Something I do not think they would like to have to do. So that is one problem.

A second one is, how are you going to set prices for water to be bought 30, 35 years in the future, set up a formula that will be equitable on both sides?

And the third one is, how do you implement a contract, draw it up so that it can be enforced, and disputes settled between the sovereign States and a city and another State, and a private investor of a water company.

These are legal problems, and I have encountered a lot of legal problems in my time. But this is one with great weight, to be given consideration. So we have there the alternative set up.

The deadline for competing the individual plans is March of next year. We expect by 1990 that we will have the alternative in place, taking water from one source or the other.

And we will have them, the entire critical area program implemented, with the ground water then being reduced to manageable levels. And the alternative sources drawn up and used to supplement the existing sources.

Mr. **Dewling**. The Massipon Reservoir is being built now to supplement the existing supply in the Monmouth County area.

So we are deciding which of the critical areas that we are looking to the ultimate supplies, and hopefully the groundbreaking will be this month, and we will also be bringing about 30 million gallons a day from other pipelines in Middlesex.

The other issues I think we all have to face as we look at the Federal programs and the Federal involvement in ground water primarily has focused on what I call conjectural activities, which require regulation.

There is no single coherent statute with ground water quality and quantity protection and remediation as its goal. And I think that is where the focus needs to be. If I look at the discharge system the State of New Jersey has, since its inception issued ground water permits in addition to surface water permits.

We do not separate ground water and surface water. It is one permit that is issued by the same group, either for ground water or for surface water. And we have issued about 700 ground water permits within the past 3 to 5 years. And that is an extension of the Federal statute.

We also have the requirement, as the general mentioned, under 8280, in which we have established 16 organic chemicals in the drinking water supply that are now affected, that pretty much require municipalities to test their waters on a routine basis in any municipality above 25 people.

And in order to comply with these, we have made certain actions on what we, when we can put new water supply systems in. We have a contaminated well field program that offers small communities loans to put in water supplies.

Also under our Superfund program, I just mention, we saw the hundred sites up there. We have received in the past 2 years 20 percent of the Federal budget in the State of New Jersey for remediation.

Most of the work obviously goes into the, not the construction yet. But it is sort of a slow process. But the immediate action of stopping or curtailing the further movement and primarily the feasibility study and design.

The big dollars will be committed probably in the next year or two, and I project, although we have only cleaned up three sites now, that we will start kicking these things in in about two years on an increased number.

But the important thing here is that that program, in addition to that we have $500 million of stake money, in addition to Federal money. We are committed to $15 million a year for water supply replacement, which I think is a major commitment that we have made.

Another program that we have is the LUST program, the Leaking Underground Storage Tank program. And basically the Federal statute covers 50,000 facilities in the State. We believe our program, which became a law last year, is a little more severe in the sense that it is more protective.

And it will cover about 125,000 tanks in the State. We include home heating oils, which we find in many cases cause the problems.

One area that I think needs to be focused on probably more significantly than most, and we have a tendency not to focus on it because we do not have a drought, and that is the good faith agreements that we have in the Delaware system.

We have a situation where, yes, we are building a reservoir up there right now, in terms of Myrtle Creek. But we have a situation for where the State of Pennsylvania and the State of New Jersey have a lot to lose.

If those projects do not go forward in terms of maintaining the flow during the critical periods to keep the salt water wedged down, and the interest seems to be waning because of the argument over who is going to pay and how they are going to pay and how the charges are going to be assessed.

And I think it sort of reflects on the problems that the general mentioned before. But I submit to you that if we do not move ahead with those projects, if there is not that type of firm commitment by the States, either New Jersey or Pennsylvania, that it would be disastrous, and we are going to lose those projects.

And I would more or less encourage and ask you to see if you can convince the court to continue proceeding while the States sort of get their act together in that particular area.

The other area is that where we have the problem is the availability of data. You need good data to make decisions. You have got to bridge that gap and the U.S.G.S. has done a major job for bridging that gap for us.

But we do not understand ground water as well as we understand surface water. We do not understand how it moves, when it gets pollutants in it, whether it moves up, sideways, down, whatever the case might be.

And there is a need to have a better understanding for decisionmaking. So there is support that is needed to have a cohesive regulatory process focused on ground water. And bridge the gap to offer grants or loans for local communities through USGS to support those types of activities.

[The prepared statement of Mr. Dewling follows:]

# TESTIMONY BEFORE THE SUBCOMMITTEE
# ON
# ENERGY AND NATURAL RESOURCES

Monday, September 14, 1987

Burlington City, New Jersey

Presented by

Richard T. Dewling, Commissioner

New Jersey Department of Environmental Protection

Ground water, the largest potential source of fresh water in the country, has for some time now been recognized as a valuable resource. In the State of New Jersey, ground water plays a very important role in serving millions of our citizens as a potable water supply. Ground water is the central source of water supply in 90% of the New Jersey land mass and is the principle source of potable water for 50% of New Jersey's 7.5 million citizens. New Jersey's recognition of the need to protect and effectively manage the state's water resources can be seen in our initiatives in developing the New Jersey Water Supply Master Plan of 1982 and the Water Pollution Control Act of 1977. The Water Pollution Control Act protects both our ground and surface water resources under the same resources-oriented regulatory umbrella, while the New Jersey Water Supply Master Plan is responsible for the broad and long-range planning of the State's surface and ground water utilization.

While some elements of a national ground water program exist, Congress and the USEPA are just now beginning to acknowledge the need for a National Ground Water Program.

What has occurred on a national level, to date, has been a steady stream of often inconsistent enactments and rules which have made the process of ground water regulation difficult to implement. Congressional enactments of environmental laws have occurred through separate authorizing Committees and Subcommittees. Each of these authorizing units seeking to put their individual imprint on a particular piece of legislation.

Federal involvement in ground water has focused on "objectionable activities which require regulation." The perceived pesticide problem resulted in the federal FIFRA. Concern for the nation's drinking waters resulted in a Safe Drinking Water Act which recently has been amended to deal with Wellhead Water Quality Protection. Abandoned sites were the focus of the original CERCLA law which has recently been amended by the SARA amendments of 1986. While RCRA is oriented towards regulating the activities of a selected set of industrial facilities in the most excruciating detail of any other federal environmental law.

In the federal management scheme, little value has been placed on cross program interfaces, particularly in the case of ground water, where a specific federal role and goal has yet to be articulated. Thus we have constituent groups, Congressional Committees and EPA program people each guarding their turf while overall National ground water management goes unattended. Clearly this is an unacceptable condition. Our nation needs a single coherent statute with ground water quality and quantity protection and remediation as its goal.

The New Jersey Water Pollution Control Act has proven over and over again the merits of regulating surface water and ground water from the same fundamental regulatory concepts. The New

Jersey Act contains all of the fundamental elements of a resource management and protection program. In New Jersey ground water must be classified according to use with individual classifications having associated ambient standards. The specific effluent discharge requirements are established under a state permit control system which must provide for achievement of the ambient standards. Actual permits which are issued have carefully structured monitoring programs associated with them. Lastly, New Jersey law provides for significant penalties should facilities be in non-compliance.

From an organizational perspective the same unit which issues surface water permits also issues ground water permits. No distinction is made between ground water discharges by industry or by municipality. Thus the Department has had an aggressive program of issuing discharge permits to all landfills including municipal refuse dumps. The results of ground water monitoring are now beginning to show that landfills are one of our primary sources of ground water contamination. While federal subtitle D part of RCRA is still trying to decide what to do with landfills, we have decided under New Jersey law that they are a threat to our resources and must be completely regulated.

The New Jersey permit program has also absorbed the sequential RCRA program of monitoring, assessment, and finally, clean-up. All RCRA ground water permits are issued concurrently under the New Jersey Water Pollution Control Act, with the stricter standards of the New Jersey Water Pollution Control Act controlling in many instances. This program sets the framework for the state's overall ground water pollution prevention and remediation program. In the last three years over 700 ground water pollution permits have been issued and are now back by the full force and effect of the law.

A major new initiative in strengthening our pollution prevention program has been added with the signing into law of the New Jersey Underground Storage of Hazardous Substances Act on September 3, 1986. The State legislation, while patterned after the federal legislation, is significantly broader in scope. The number of tanks regulated under the federal program in New Jersey is estimated to be 50,000. Under the State program the regulated universe has been expanded to an estimated 125,000 tanks by the inclusion of heating oil as a hazardous substance under the act. The State act also sets up the State Underground Storage Tank Improvement Fund. Monies in the fund will be used to provide low interest loans to owners of facilities required to replace or repair existing tanks.

Another major program initiative is the New Jersey Environmental Cleanup Responsibility Act (ECRA), which became effective on December 31, 1983. The law imposes pre-conditions on real estate transactions for certain categories of facilities which deal with hazardous substances or hazardous wastes. Regulations require owners to conduct an environmental audit of their facility prior to any real estate transaction. It is basically a buyer protection program.

From the period of January 1984 to June 1987, there have been 32,000 facilities required to file under the ECRA program. It is estimated that approximately 10% of the facilities that filed would be required to perform some type of ground water remedial action.

By far the largest sum of money being spent on ground water cleanups in New Jersey are currently being conducted as part of the CERCLA program. As of May of this year, the EPA had allocated approximately $82 million to the state of New Jersey for the current U.S. fiscal year. Approximately 73.3 million, over 90% of this total allocation, will be used for remedial investigations, feasibility studies, project designs and final clean up actions at our 100 NPL sites.

While the CERCLA program will be effective in eventually providing in-depth hydrogeologic investigations at New Jersey's 100 NPL sites, the need exists for fast-track pollution implementation when private homeowners and public community wells are impacted by contamination.

In principle, provision of water supply to the population is a municipal responsibility. However, local units have neither the experience, nor the the technical and financial capability to manage the situation. As a result, the State's Contaminated Well Fields Program provides technical and planning expertise to the public for determining the extent of contamination and development of cost-effective and reliable water supply alternatives. Remedial investigation/feasibility studies conducted to determinate of the most cost effective and reliable alternate source of water supply are funded from the 1981 Water Supply Bond Fund. Through such studies, the State can accurately identify the appropriate course of action for correction of the problem. 1981 Bond Funds can be used to provide low interest loans to townships once the appropriate water supply solution has been identified.

With the adoption of the State's new Maximum Concentration Limits, developed by the New Jersey Drinking Water Quality Institute and based on criteria set forth in the A-280 law, it is anticipated that the number of contaminated wells in violation of these new limits will far exceed the resources available to investigate the cases and finance their appropriate remedial actions. Undoubtedly, a priority system will have to be established to determine how our limited resources can best be utilized or, alternatively, larger sources of funds will have to be developed to finance the remedial measures.

Programs of ground water pollution protection and remediation can improve the conditions of New Jersey's aquifers but only gradually and over a period of many years. Unlike surface water, contaminated ground water is only slowly responsive to removal of the source of contamination. Therefore, in order to achieve the purpose of maximum utilization of New Jersey's ground water, the existence of varying kinds and degrees of contamination, much of which is not currently known with any degree of accuracy, must be accepted as a prevailing condition. It is New Jersey's goal to maximize the effective use of its ground water supplies in conjunction with its surface water supplies. And to that end, we expend a great deal of time and man power on our ground water utilization programs in addition to the prevention and remediation programs.

Formal long-range and policy planning for utilization of surface and ground water is conducted through New Jersey's Water Supply Master Plan. The Plan contains our goals and describes the steps we intend to take now and in the immediate future to meet these goals. To maintain the effectiveness of this plan, it must be kept current and accurate, as situations and technologies change. Thus, the DEP is committed to periodically evaluate changing needs and conditions and, if necessary, to redirect activities or initiate new activities. The initial Water Supply Master Plan was approved in 1982, updated in 1983 and 1985; and the third update and the first major revisions are currently underway. Its purpose is to plan for the long term development, use and protection of our water supply resources and to identify the need for feasibility studies, and demonstration projects.

The original Master Plan identified various water supply problems including deficits facing the Passaic and Hackensack Basins, overdrafting of ground water supplies in some cases resulting in salt water intrusion, ground water development stresses, deterioration of water supply infrastructure, and the need to restore the balance between the demands placed on the Delaware River and its available water supply.

These problems are currently being addressed through the implementation of the Plan's recommendations. For example, the Wanaque South/Monkville Reservoir Project is currently under construction. This project should provide sufficient supplies to satisfy the area's water supply demand until the year 2010.

The South River Basin Water Supply Feasibility Study is nearing completion. Implementation of this study's recommendations should provide Middlesex and parts of Monmouth counties with sufficient supplies until 2020.

Ground water development stresses and heavy withdrawals lead to the delineation of Critical Area #1 which encompasses parts of Middlesex, Monmouth and Ocean Counties. The water supply needs of this area are being addressed by implementation of two projects, the Manasquan Reservior Project and the Middlesex Pipeline. The Manasquan Reservior project, with a reservoir capacity of 5 billion gallons, will provide a yield of 30 million gallons per day and will be used conjunctively with ground water supplies. The additional supply provided through this project will meet the areas needs up to the year 1990. It is very clear, however, that additional supplies will be needed in the future and this issue is to be addressed in the Revision of the Master Plan.

The Middlesex Pipeline will bring an additional 40 mgd of Raritan River water down in to the Northwestern portion of Critical Area #1.

Critical Area #2 is situated within the Delaware River Basin. It encompasses portions of Burlington, Camden, Glouchester, Salem, Atlantic and Ocean counties. The DEP's Critical Area program will help reduce the overdraft of the Potomac-Raritan-Magothy formation within the area and the Camden Metropolitan Area Water Supply Study will recommend new sources of water to meet the needs of this area to the year 2020.

The Delaware River Basin presents a unique hydrologic unit for New Jersey water supply planners because it is shared so widely with three other states. The mechanism for interstate planning and management of the basin is the Delaware River Basin Commission.

The fundamental surface water problem facing the Delaware Basin has been how to restore a balance between the demands placed on the river and its available developed water resources. This problem is intertwined with a number of ground water problems including aquifer overdrafting, the ground water/surface water interface, and aquifer contamination by salt water intrusion and land use activities.

New Jersey and other basin states are addressing these problems through implementation of the recommendations of the Plan and the DRBC "Good Faith" Agreement. As a result, the Merrill Creek Reservoir is under construction, and the planned modification of the existing Francis E. Walter and Prompton reservoirs will provide significant new flow augmentation storage in the basin in order to achieve more restrictive salinity standards in the Delaware estuary and provide for increased depletive use to the year 2010.

In addition to the above mention achievements, other Master Plan recommendations have been implemeted including: the completion of the D&R Canal improvement; modification, rehabilitation, and/or expansion of several water systems; the constuction of new interconnections; the completion of the Northeast New Jersey Feasibility Study, and the near completion of the South River Basin Water Supply Feasibility Study. In addition, a feasibility study to examine the Confluence and Six-Mile Run Reservoirs will be initiated in the near future. Finally, a regional management study of the Passaic River Basin was initiated to determine how purveyors could increase the safe yield of their combined systems through regionalized, rather than individual operation.

As previously stated, the Water Supply Master Plan identified areas of the New Jersey Coastal Plain which were experiencing potential ground water supply problems and recommended that water supply feasibility studies be performed. Between 1983 and 1986 three feasibility studies in the South River Basin, Camden Metropolitan Area, and Atlantic City were initiated by engineering consultant firms under contract with the NJDEP. During the same period, comprehensive five year hydrogeological ground water studies were begun under cooperative agreements between the U.S. Geological Survey (Trenton, NJ) and the New Jersey Geological Survey. These studies investigated ground water quality, use, pumpage, water levels stratigraphy and hydrogeological characteristics. Information from the hydrogeological study and other sources, has been used by our consultants to evaluate dependable aquifer yields, pumpage overdraft, water use, water quality and projected demand.

New Jersey passed The Water Supply Management Act in 1981, which gave the New Jersey Department of Environmental Protection (DEP) the authority to manage the water resources in the State to a much greater degree than previously. To implement this Act, the General Water Supply Management Act Rules, were adopted. These rules provided for the establishment of Water Supply Critical Areas as the mechanism for implementing the ground water preservation aspects of New Jersey's water supply management program. In these Critical Areas, where severe water problems exist, the DEP is empowered to exercise regional management controls which are not applicable elsewhere.

Critical Area No. 1, located in central New Jersey along the Atlantic coast, has four critical aquifers: the Upper Raritan (Old Bridge), Lower Raritan (Farrington), Englishtown, and Mt. Laurel-Wenonah. Critical Area No. 2, located in southern New Jersey has one critical aquifer: the Potomac-Raritan-Magothy. Within each Critical Area there is a depleted and a threatened portion for each critical aquifer. The boundaries for the depleted portion were developed based upon 1983 aquifer water level data for the minus thirty food (mean sea level) potentiometric contour. The threatened portion is a three mile "margin of safety" surrounding the depleted portion.

Water Users affected by the Critical Areas delineations are facilities which have wells within a critical aquifer with the capacity to pump over 100,000 gallons per day (gpd). They include public community water supplies, industrial users, agricultural users, etc.

As a result of studies performed with the United States Geological Survey, it has been determined that water users withdrawing from the depleted portion of the aquifer must achieve up to 50% reduction in their 1983 pumpage.

Once an affected water user is issued a "Notice of Intent to Modify A Water Supply Allocation Permit", the user has fourteen months to submit an Alternate Water Supply Plan to the DEP.

The objective of an Alternate Water Supply Plan is to develop a strategy for reducing the water users dependency on critical ground water supplies. The plan must detail how the user will achieve the required reductions in water usage and how future water needs will be met.

Most affected users in the Critical Areas will have to obtain alternate water supplies in order to reduce their withdrawals from the depleted and/or threatened aquifers. Some examples of alternatives are: development of regional supplies; utilization of surface waters; use of non-critical ground water supplies; "unconnected user" arrangements; and conservation methods.

Within both Critical Areas, there are major regional water supply projects planned. As previously stated within Critical Area No. 1, there are two projects under way. The first is the Manasquan Reservoir Project which will have an estimated safe yield of thirty (30) million gallons per day (mgd). The second project is a proposed pipeline which will bring approximately 40 mgd of Raritan River water down into the northwestern portion of Critical Area No. 1. The regional project for Critical Area No. 2 is still being studied. This project will utilize the Delaware River. Water users can also develop their own surface water supplies.

In order for the Critical Area No. 2 water users to be able to utilize Delaware River water without adversely affecting the salt water gradient within the River, the State is relying on the successful implementation of the F. E. Walter Reservoir modification project.

The F. E. Walter Project is intended to provide flow augmentation to offset low flow conditions and prevent salt water intrusion in surface water intakes and water supply aquifers in the Camden area, and to provide additional water for growth within the Delaware River Basin. New Jersey stands to lose more than the other down Basin states if the Walter Project does not proceed. If drought occurs, not only would expansion and development be precluded, but the aquifers in the Camden area providing existing supplies could be irreparable damaged by salinity intrusion.

The U.S. Army Corps of Engineers has already received a $1.5 million appropriation from Congress or design, initiation, and implementation of this project.

The Delaware River Basin Commission (DRBC) through the "Good Faith Agreement" provides for commitment on the part of the lower basin states (New Jersey, Delaware and Pennsylvania) to fund flow augmentation to meet water supply and salinity objectives in the Delaware River mainstem.

A component of the Delaware River Basin Commission's "Good Faith" agreement calls for New Jersey, together with Pennsylvania and Delaware, to develop a financing mechanism for the non-federal share of expansion, for water supply purposes, of the existing F.E. Walter flood control reservoir located on the Lehigh River in Pennsylvania. Furthermore, New Jersey's Water Supply Master Plan has recommended the implementation of this project. The modification of the existing F.E. Walter Reservoir by 1990 and the Prompton Reservoir at a later date represent a quicker and more acceptable way of providing for New Jersey's water supply needs than the siting and construction of a totally new project elsewhere in New Jersey or a mainstem dam such as Tocks Island.

The 1981 Water Supply Bond Fund has insufficient unallocated funds remaining to finance the F.E. Walter project, therefore an alternative means of financing the project must be developed. New Jersey is recommending that Section 15.1(b) of the Delaware River Basin Compact be amended to permit a Broader Revenue Base.

This section, imposed by Congress in ratifying the Compact, prohibits the Commission from imposing any charges for water withdrawals or out-of-basin diversions if they lawfully could have been made without charge on the effective date of the Compact, October 27, 1961. This provision met a constitutional challenge in Delaware River Basin Commission vs. Bucks County Water and Sewer Authority, 701 F.2d 155 (1983). The validity of the Congressionally-imposed exemption for pre-Compact users was upheld.

The important next step in the implementation of the F.E. Walter project is the reintroduction of legislation in Congress for the amendment of Section 15.1(b) of the Delaware River Basin Compact. Without this financing commitment, the federal government could deauthorize the project.

The amendment of Section 15.1(b) will permit all users in the Delaware River Basin, including ground water users, to be charged equitably in recognition of the fact that they benefit from the added storage. The revenue would provide for non-federal costs.
The recent revisions to the updated Water Supply Master Plan will require that the following assessments of ground water be conducted:

> Estimate losses of ground water sources and supplies from contamination/pollution amd pumpage overdraft up the year 2040
>
> Review existing reports on surface and ground water quality in New Jersey.

Provide recommendations for wellhead and aquifer protection programs.

Calculate water supply deficits to the year 2040 based upon demand projections and supply limitiations.

In addition the Plan will investigate the need for a long term Water Supply Plan for the Cohansey and Kirkwood Aquifers in the Cape May County Regional Area. This area is experiencing problems with salt water intrusion into the Cohansey and Kirkwood aquifers. Furthermore, there has been large scale growth in development in the area over the past few years which has raised the question of whether a long-term water supply is available for existing and future development.

Lastly, the Master Plan will recommend a Water Supply Feasibility Study for the Buried Valley Aquifer System. The Buried Valley Aquifer, which is located in Morris and Essex counties, is an important source of ground water supply experiencing pressures from development which require additional supplies and water losses due to ground water contamination. The Division of Water Resources has been receiving an increasing number of objections to new diversion application requests because of concerns of declining aquifer water levels due to over pumpage. The water quality problems are a major concern in the area. There is significant ground water contamination in the Buried Valley Aquifer System due to a number of different sources such as septic systems, industrial discharges, spills, etc.

Over the past year, the NJDEP has concluded that a Ground Water Management Strategy is needed to integrate all ground water functions and to coordinate them with other state-wide environmental functions. Our final Strategy document is due to be completed by June 1988 and will incorporate the 10 ground water goal recommendations made by the National Ground Water Policy Forum in November '85. The Strategy will assess the State's current ground water programs, recommend changes to maximize program benefits and outline areas that will require new program development, legislation, or funding.

It has already become obvious through preparation of the Draft Ground Water Management Strategy, which will be completed by the end of this month, that the State is seriously lacking the resources needed to perform essential ground water research.

Our ability to delineate Critical Areas, determine the extent of contaminant movement, recommend appropriate clean-up technologies and assess health risks to the public is contingent upon our ability to finance hydrogeological studies, research projects, and perform ground water modeling.

This brings me to my recommendations of how the Federal government can assist the states in ground water management.

The ability to acquire basic yet essential data is the cornerstone of a resource management program. Yet, New Jersey as many other states, has discovered that we are lacking sufficient funds to dedicate to this cause. All NJDEP programs rely upon the existence of an updated and complete data base. Before technical decisions can be made, we must be sure we have the correct information to feed into the decision-making process. This information is currently being gathered in a piecemeal fashion based upon the funds available to the different Department programs. What New Jersey needs from the Federal government is the funding and manpower to bridge the gap between idea and implementation. The USGS, as mentioned earlier, has been invaluable to the State in obtaining the information needed to delineate the Critical Areas. Continued work on the part of the USGS will be essential to the success of other projects in the near and distant future.

The State of New Jersey supports the efforts of Congress that call for establishing ground water research programs, such as Bill S-20 introduced by Senator Moynihan. Such a bill could assist states in gaining knowledge of hydrogeologic regimes, contaminant characteristics, treatment technologies and health effects. I strongly urge the Congress to pass just such a bill, as it will give the states the resources to improve their sadly undeveloped ground water data bases.

Presently, there exists a real opportunity at the National level to clarify and integrate water resources management issues. The formula for success would be for Congress to build upon existing successful programs, such as the Clean Water Act, as the model for new National ground water legislation. This action, which could mandate the harmonious integration of all ground water related laws, would be a giant step forward for the environmental movement. In this manner RCRA, HSWA, SARA, FIFRA, TSCA, and the Safe Drinking Water Act could all begin to operate toward a common National goal.

It would not be unreasonable for Congress to establish the degree of resource protection which they would be seeking in new National ground water legislation. Additionally, Congress could require the states to develop individual ground water management strategies addressing both quality and quantity issues, establish ambient ground water standards, classify aquifers by designated use, and fix ground water clean-up and discharge standards.

Federal guidance in ground water management can be a useful tool in National protection of the resource, however, program details and other specifics should be left to the discretion of the state where each state will have its own areas of primary concern. The Critical Water Supply Area Program which is essential to the halting of salt water intrusion in the coastal plains of New Jersey is certainly of little interest to inland states.

In summary, the State of New Jersey is steadily and successfully moving forward in its goal to develop an integrated ground water management strategy that will protect our valuable resources. This is achievable through the successes of our New Jersey Water Pollution Control Act, and Water Supply Master Plan. We feel the federal government can be greatly helpful in supplying the states with resources for research and ground water studies. Additionally, Congress could pass National Ground water legislation requiring management strategies and standards. The EPA's role should be one of guidance and oversight, while the USGS should continue and expand its role in performing hydrogeologic studies and providing essential ground water data.

I'd like to close today by offering this subcommittee the full range of the New Jersey Department of Environmental Protection's services in meeting the goal of developing National ground water legislative.

Senator BRADLEY. Thank you very much, Commissioner Dewling. I just wanted to ask two questions, then move on to the other panelists.

New Jersey is unusual in that the State has paid almost 100 percent of the U.S.G.S. cost, in many cases. Is that not correct? Because the State wanted to get that expertise, to chart the ground water problem in the State.

Mr. DEWLING. Yes. We would like to do more with U.S.G.S. But unfortunately they do not have the staff to handle some of these additional requirements that we have.

I mean, the radon problem is a critical one in New Jersey. We just came out the other day to indicate that 33 percent of our homes in the State potentially may be impacted by radon.

The biggest area of highest potential is up in the northern parts. And radon in the ground water is going to be a problem, and that comes in the house by the toilet bowls, where it just sits.

We do not have enough information, that is the database that is our critical need.

Senator BRADLEY. Now, on the critical area number two. This DRM area, where there is a 35 percent conservation requirement.

DEP had several alternatives. One was the Delaware, one was buying it. The other was tapping the portion of the Cohansey. Are you recommending now to make up for their 35 percent?

General WHIPPLE. We have not made a final formal decision. But we have closed out several alternatives. One of the alternatives we closed out very early in the process.

Senator BRADLEY. So the Cohansey diversion is now over?

General WHIPPLE. The Cohansey diversion is over.

Senator BRADLEY. But not from the Cohansey outside the pinelands?

General WHIPPLE. That is right.

Senator BRADLEY. So that is still under consideration?

General WHIPPLE. The Cohansey diversion that is under consideration is the headwaters of the Morris River in the Gloucester County area, by the local people who want to build wells, that well does not go through the pinelands or into the pinelands.

But there are environmental objections to doing that. And so this is an area that has been worked up with the local people, and we are going to have to hold hearings and make some decisions.

That will be a matter of probably in the neighborhood of ultimately perhaps as much as 15 million gallons, which would reduce the 55 total requirement down to 40. But at least 40 million new gallons a day is going to have to come directly from the Delaware. That much is certain.

But the rest of it, whether, how far to be extended, and how much their ground water will be allowed in Gloucester County is still in question.

Mr. DEWLING. We have not done our final recommendation yet.

Senator BRADLEY. When will you be making those recommendations?

General WHIPPLE. Probably by the end of the year.

Mr. DEWLING. But it is clear, we are going to have to develop a source of ground water, and it would seem politically proper to use the available water base in the city of Philadelphia.

When they lost a lot of their breweries over there, they had an abundance of water. [Laughter.]

Mr. **Dewling**. There is an availability of water. The ironical thing is that there is the institutional framework where our requirements are stricter than the Federal Government. We would then have to treat Philadelphia's water supply.

Senator **Bradley**. But I am just trying to get a fix on what is the decision, not what will it be. But you have identified potential sources, Delaware, Philadelphia, the Winslow-Waterford area, the Gloucester County area.

Now you will eliminate and choose one or two of those?

Mr. **Dewling**. Or a combination of them.

Senator **Bradley**. So it is possible that you could have all four?

Mr. **Dewling**. It is possible, but I would not say likely.

Senator **Bradley**. One last question. You mentioned that you recommended a $700 million capital loan program to counties.

Mr. **Dewling**. Yes.

Senator **Bradley**. On what?

Mr. **Dewling**. For handling the problems associated with the abandoned landfills. All of the other crazy dots that U.S.G.S. had there are these other landfills out there that sort of sit out there.

Senator **Bradley**. Do you mean the camouflaged landfills? [Laughter.]

Mr. **Dewling**. What I would propose to, through our capital budget, was that the counties could not be expected to come up with the millions and millions of dollars to address these issues.

Responsible parties are not readily available, and in many cases it was a municipality that was the responsible party.

What I am proposing is a loan program comparable to the one that we have in our environmental trust, where we offer loans to municipalities to address those issues and to have several priority lists, a screening program, what have you. But about $700 million in the capital program for loans.

Senator **Bradley**. And would that come from the A-1 bond issue revenues?

Mr. **Dewling**. No.

Senator **Bradley**. This would be new bonding? And it would be used for what?

Mr. **Dewling**. Study, determining how to take corrective action at these landfills and things for the corrective actions in the landfills.

Some of them will never qualify for Superfund, I mean because you are on Superfund, to be honest with you, we are putting some on the Superfund list as a penalty to some because when you get involved in the Federal bureaucracy, that is just a long term issue that most companies would like to stay out of.

Senator **Bradley**. Thank you very much, Commissioner. Just stay and then we will hear the other witnesses.

Do you have anything else you would like to say about the cooperation with the U.S.G.S.?

Mr. **Dewling**. It has been superb, and we would like to be able to do more. Right now we have the money to pay them, but they do not have the people to handle this in many cases.

Senator **Bradley**. Well, I understand U.S.G.S. does have the positions, so maybe we are hearing today an expanded program. [Laughter.]

Mr. **Dewling**. Well, since we loaned EPA $42 million to keep the Superfund program alive, maybe we could help the U.S.G.S.

Senator **Bradley**. Thank you very much, Commissioner. We appreciate your presence today and your testimony.

Mr. **Dewling**. My apology, I have to go up to Woods Hole on our dolphin problem.

Senator **Bradley**. Now I would like to hear from Secretary Art Brown.

## STATEMENT OF ARTHUR R. BROWN, JR., SECRETARY OF AGRICULTURE, STATE OF NEW JERSEY

Mr. **Brown**. Thank you, Senator.

It certainly is a pleasure for us for the Department of Agriculture to be represented here to discuss one of the most critical issues in agriculture today, and that is the water issue. And first of all, I realize, we must realize the necessity of an adequate water supply. There is just a very deep need for the survival of agriculture in this State.

So the New Jersey Department of Agriculture, through the state's Soil Conservation Committee, which I chair, and the soil conservation districts, has a key role in agricultural water management in the state.

Technical and financial assistance is provided to farmers to improve farm water management through runoff control, increased filtration, development of nonfarm impoundments, and improved irrigation systems.

The application of these conservation systems, which have been recognized by the Environmental Protection Agency and the Department of Environmental Protection as best management practices, also results in improved water quality.

I would like to discuss some of the Department's specific concerns with regard to agricultural water use.

New Jersey is fortunate to have an abundant 40 or more inches of precipitation annually, which would seem to be an ideal situation. However, in every growing season there are critical periods when irrigation is a necessity.

Virtually all Garden State farmers who raise fruits, vegetables, and nursery stock supply supplemental water throughout the growing season to keep their crops alive.

The irony is that these higher value crops require more intensive management and are more dependent on irrigation than, for example, field crops like soybeans and grain.

The best illustration of this is the booming nursery industry, which has been the State's top agricultural product since 1984. The second and third top products of vegetables and fruit crops are also very heavy consumers of water.

Together, these three crops account for two-thirds of New Jersey's agricultural total cash receipts. They will assume an even more critical role in the future as the movement towards intensive, higher value crops continues in the State. With the extreme high land values that we have in the State and the population density, we will go toward more intensive agriculture, and that is the way we have been moving up to this point.

The trends in New Jersey agriculture, therefore, point to growing industry dependence on supplemental water in the future. As the most densely populated State in the Union, New Jersey also has the highest farmland values in the Nation.

As development pressures and land values continue to rise, our farmers must turn increasingly to the prime value crops in order to remain in agriculture. The land values in New Jersey, agricultural land values, jumped some 36 percent this past year and the year before they jumped about 14 percent.

And we by far are the fastest rising State as far as agricultural land values in the country. And when you go to the Midwest, you will find——

Senator **Bradley**. So in the last 2 years you have seen a 50 percent increase in land values?

Mr. **Brown**. That is right. In the last 2 years we have lost 95,000 acres of farmland. This has applied directly to development. So the pressure is on agriculture, a lot more than what I would like to see.

But without adequate water supplies, none of these commodities which represent the bulk of one of the State's largest industries would be able to be produced. All signs point to a future of increased competition for all water and increased water needs for New Jersey agriculture. I have therefore made this issue one of the highest priorities of my administration.

Last year I initiated a multi-agency agricultural water advisory committee. The membership includes representatives from the Federal, State, and local levels, all of whom are directly involved with the water situation.

With this committee in place, the Department has begun work to protect the future water needs of agriculture in a scientific and statistically reliable manner. The Department has identified water planning districts and is developing water demand projection methodology.

Through scientific modeling, we hope to be able to calculate water needs by district, crop, and soil type under normal rainfall and severe drought conditions, and for various time frames—1990, 1995, 2000 and beyond.

Short-term estimates of current agricultural water usage will be ready by the end of 1987. The long-term projection system to predict future agricultural water needs should be available within the next 2 years.

This data will be available as a basic resource in the formulation and promulgation of all water supply, development, and management plans, policies, guidelines, and regulations pertaining to agriculture.

This data will also be invaluable in our cooperation with DEP as they update the State water supply master plan, another important area of concern for New Jersey agriculture.

Reviews of this plan have led the agricultural sector, including not only the production side but the food processing industry as well, to become concerned over its provisions for the needs of agriculture.

If we are to maintain a viable agriculture, we must ensure that the industry's needs are recognized and provided for in a balanced update of this plan, and in fact in any water management plan which impacts on agriculture.

Another issue of concern to New Jersey farmers is the threat of salt water intrusion into the State's aquifers during low flow periods. This was referred to earlier. This issue gives rise to two specific areas of concern to the farming community.

The first grows out of increased competitive demands due to accelerated urban development in the two critical ground water areas delineated by DEP. Fortunately, not too many farmers have been impacted so far by usage restrictions in these Monmouth and Camden County areas.

However, Cape May County area is also being investigated for possible delineation as a critical area. Farmers there express concern that population growth in their area may lead to usage restrictions which would seriously impact on their ability to farm.

The second salt water intrusion issue affecting New Jersey agriculture relates to actions proposed by the four-state Delaware River Basin Commission to increase low flow augmentation in the Delaware River.

The financing of DRBC's F.E. Walter and Prompton projects, proposed for enlargement to provide additional release during low flow periods, includes a system of user fees.

The Commission members have determined that the cost for these projects should be allocated among those users who will benefit. Agricultural users are included. Some projections have shown substantial charges falling to farmers. This would place them in a cost differential situation, making them less able to effectively compete with farmers outside the basin.

From the point of view of agriculture, an equitable system of charges should recognize a credit to agricultural users for the rainfall retention and aquifer recharge contributions permitted by their preservation of open space. Certainly farmlands provide a far greater opportunity for recharge and retention than the rooftops, streets, and parking lots which come with urban development.

Also, an analysis of agricultural water usage shows it to be primarily seasonal, not continuous, as with most other users. Any proposal for charges to farmers should therefore not be calculated on the basis of higher seasonal usage figures.

In implementing programs, our Department has enjoyed a close cooperation with the U.S. Department of Agriculture, which provides most of the technical and some of the financial assistance.

This Federal role is provided through and at the request of our soil conservation districts. We believe this is a vital role for the Federal Government and one which should be expanded.

We have also entered into an agreement with the USDA's Soil Conservation Service and the U.S. Geological Survey in the development of our methodology for the projection of future agricultural water needs. We believe that this type of Federal involvement is important and should be maintained.

We do not envision an increased Federal role in the regulation and management of water, at least for agriculture, at this time.

Finally, as we plan for the future of agriculture in our state, we must remember that water is its life's blood. As New Jersey continues to develop and to lose farmland to housing and industry, the competition for available water will become more intense. This situation gives rise to problems like increased threat of salt water intrusion and the possibility of usage restrictions.

Programs developed to manage water must consider the special needs and problems related to agriculture. Only in this way can we maintain our food producing capabilities and preserve the open space which provides for aquifer recharge and important esthetic benefits to the citizens of the State of New Jersey.

In the New Jersey Department of Agriculture, we have placed high priority on the development of data and projections which, when utilized as a resource in water management programs, will assure adequate water for agriculture in the future.

The cooperation of other State and Federal agencies has been invaluable in the establishment of our agricultural water advisory committee and will continue to be invaluable as we work to maintain a healthy and productive agriculture for New Jersey.

Senator BRADLEY. Thank you very much, Mr. Secretary, for your testimony.

Let me just ask you a couple of questions. How do New Jersey farmers now pay for their water that they get?

Mr. BROWN. There is no fee for the water for agriculture. Mostly they just pay for putting in a well and buying the irrigation systems that they have, as opposed to the West, where a lot of it in the Western part of the country is subsidized by the Federal Government. All costs are borne by the farmers.

Senator BRADLEY. So the farmer essentially pays everything. He pays everything, and in New Jersey it is almost all ground water?

Mr. BROWN. Basically, all ground water. There are a few water retention ponds in the southern part of the state. It is basically all ground water.

Senator BRADLEY. Is there any kind of a rule of thumb as to what percent of the farmer's costs go to the water system?

Mr. BROWN. Well, that is very difficult. It differs from operation to operation, but irrigation systems are very expensive, just like any other type of equipment that they purchase, plus the energy required to run them is expensive. So it is not cheap to irrigate.

When you get into a season like we are just coming through now, we have had some wet spots in the northern part of the state, but they do not irrigate nearly to the extent that we do in the southern part. And just as of this weekend we got a little bit of rain to help with that, but before that we had about a half an inch in ten weeks.

So we have been irrigating regularly. And when you get into a large farming operation, you can figure it is going to cost you $15 to $17, maybe even $20 an acre for every crop.

Senator BRADLEY. $15 to $20 an acre?

Mr. BROWN. Yes, when you figure all of the expenses.

Senator BRADLEY. You mentioned on the Delaware River Basin Commission the suggestion that fees be charged to farmers. You mentioned two things that should be considered.

One is do not charge on high seasonal figures. Could you go over that again?

Mr. BROWN. Well, we do not feel that you should look at a farmer and say—the only time we use much water is during the summer time. We do not want the assessment to be put on that high summer figures. We would like it to be averaged over the entire year.

If he uses over 100,000 gallons per month, we would look at the total gallons rather than the high summer usage.

Senator BRADLEY. So take a yearly and not a peak.

The other thing you suggested was that there should be kind of a credit against any potential fee based upon open space, as an argument there being that open space recharges the aquifer.

Mr. BROWN. That is right.

Senator BRADLEY. Do you have any—if you have a formula for that or if you have thought about it?

Mr. BROWN. We do not have a formula, but we could probably come up with one. But we are really concerned about the charges. If it is just a few farmers in that particular area of the basin that draw on this, it would be expensive for the new projects that are going to be borne by the user. It would be extreme.

As a matter of fact, it would probably be so much that it would put the farmers out of business if they have to compete with the rest of their neighbors across the river and in the neighboring states and also the rest of New Jersey. Then any time you put them in that position, they just might as well sell their property.

Senator BRADLEY. How many farmers would you say are in that kind of jeopardy?

Mr. BROWN. I do not know what the numbers are in that particular basin.

Senator BRADLEY. 1,000?

Mr. BROWN. No, maybe 300.

Senator BRADLEY. The State strategy to deal with agricultural pollutants and pesticides, how do you—how have you reacted to that? How has the farm community reacted to that?

Mr. BROWN. Well, I think the farm community is just as concerned as anybody else, probably more so. They live on the farms. Someone from Elizabeth probably has a lot of concern about it, but I think the farmer and his family have as much concern or more because they live right on the farm and they drink the water from that area.

Most all of the ground water is not in the city water supply in those areas, so they are very concerned. And anything they can do to help the situation—and the Department of Agriculture, of course we are working, trying to develop parisites that can be used as a substitute for pesticides, to cut down on the amount of pesticide use.

Senator BRADLEY. Do you think you have sufficient knowledge about this problem, or could you get more information from the EPA or the DEP or the U.S.G.S.?

Mr. BROWN. We work with the U.S.G.S. and all of the agencies you mentioned. EPA of course is running the national ground water study now, and I am sure New Jersey will be sampled.

But we have had samples run by our local DEP for pesticides, to determine if there is something happening.

Senator **Bradley**. And what have been the results?

Mr. **Brown**. I think the one chemical that has been found I believe in most cases that there is a systemic issue, they have found in ground water not only in New Jersey but in many areas, that is an allocarbon.

That is a systemic insecticide, and it is very soluble and gets into the ground water. But usage in New Jersey is substantial.

Senator **Bradley**. Do you think, is any agricultural land endangered by any contamination that you know of?

Mr. **Brown**. I would not say by pesticide contamination. There may be some of these toxic sites that you are talking about. We do not even know where they all are at this time. We have got a lot of them pinpointed, but we do not have them all. And that could cause contamination.

And the other contaminant of course is salt water. Some plants are not too tolerant, and that is something we are very concerned about.

Senator **Bradley**. Thank you very much, Mr. Secretary.

Mr. Kauffman, would you like to proceed.

## STATEMENT OF CHARLES I. KAUFFMAN, JR., HEALTH OFFICER, OCEAN COUNTY, NEW JERSEY HEALTH DEPARTMENT

Mr. **Kauffman**. Thank you, Mr. Chairman.

It is nice to be able to find somebody else that carries so many diverse issues as you, Senator, because it was about a month ago that you were in Ocean County on home health, which I am involved in, and today again in regards to groundwater pollution and what we can do on that.

I wish I could have some assistance from the U.S. Geological Survey team there to put up one chart that you had, the one on contaminated wells in New Jersey, if you could.

The County of Ocean is particularly interested in and protective of its groundwater aquifer. And as the Cohansey and Kirkwood aquifers are its primary reservoir, public and private water supplies, these aquifers are also the underlying sources of water for the New Jersey Pinelands and must be preserved as a protection for this unique area.

And one of the things I would like to be able to do is to show you Ocean County. And although it looks as if Ocean County—that is the area that is shaded in the dark purple. It is the area that says it has more than 300 contaminated wells. And it is probably, if you just look at that, the one with the biggest problem.

As I go on, I do not think that you will find that Ocean County has the biggest problem, to the extent that we have worked harder to find our problems than any other county in the State. And I think that, as New Jersey is recognized as having the most Superfund sites, it is because New Jersey has researched down where there could be possible sources of contamination.

Ocean County has done similar in trying to locate those individual water supplies that are contaminated to protect the public's health. The county of Ocean has participated in the Federal 208 water quality work programs, the program with the U.S. Geological Survey team, and other State and Federal projects.

We have been found to contain 10 Superfund sites located in Ocean County. In 1979, under new State legislation the Ocean County Board of Chosen Freeholders created the Ocean County Board of Health. The Ocean County Board of Health has had the privilege to create county-wide environmental ordinances and has adopted far-reaching regulations to protect our precious ground water supply.

Before I go into some of those ordinances and so forth, I would like to give a history of how the Ocean County both Board of Chosen Freeholders and Ocean County Board of Health felt that they should develop programs to protect its citizens in relationship to the groundwater pollution.

In 1973, I think it was about the foremost in finding volatile organic pollutants. The Pleasant Plains area, Dover Township, covering approximately two square miles, was found to be contaminated with volatile organics. And back then we used—oh, at that time we did not even have a laboratory. But we found that there was phenols in this area, we found carbon tetrachloride, toluene.

And with the help of the Federal Government, the State Government was able to move in and bring public water to that entire 2-square-mile area.

That area was also studied by the Federal Government as the economic impact of what could happen if an area like that was found, and a complete study with regards to the impact, not only on the individual persons but on the Government and the loss in housing and so forth.

A few years later, Ocean County then came up with another problem called the Legler section in Jackson, which was historic in setting awards in regards to benefits to the effect of homeowners and so forth in an area. And this was found to be caused by the operation of a municipal-operated landfill, receiving some kind of chemical.

Senator BRADLEY. Excuse me, Mr. Kauffman. If you could summarize it would be helpful, because we are kind of up against the clock here.

Mr. KAUFFMAN. What I would like to say is that over the years in Ocean County we have found many, many varieties of sources of pollution. Currently we are working on four existing sites. The largest is over 58 homes located in Manchester Township.

I think that, in summarizing it, that the Ocean County Board of Health has been in the forefront of adopting ordinances to prevent dumping and in developing an ordinance that requires that each and every property owner that has an individual well have that well tested, either when property changes hands or either for resale or where tenant property is involved each time there has been a change in tenancy, and for every new well.

This ordinance requires extensive testing for heavy metals, volatile organics, in addition to bacteria.

Senator BRADLEY. What has been the public reaction to your requiring more extensive water quality testing?

Mr. KAUFFMAN. Well, this ordinance was developed over—it took place over a year. There were many hearings. I think the reception is good at the present time. Since it is a new ordinance, it only has been in effect about 4 months, I have to say that the jury is out on it.

We may find problems, but it is doing a good job, which our Board of Health wanted it to do.

Senator **Bradley**. Any time anybody sells a home, they have to certify their water quality?

Mr. **Kauffman**. That is correct. They have to have a water analysis and testing by a certified lab, in accordance with standards set down by the DEP.

Senator **Bradley**. What happens if the water tests positive?

Mr. **Kauffman**. Well, we are working on four different sites right now. There was a 14-home area contaminated site that was found in Dover Township about a month ago, and public water was brought in.

There was a four-home area in Dover Township again found, and public water is in.

There is a 58-home site right now in Manchester Township, which we're still studying, and the public water again is being brought in there.

The question is how far do we extend the mains. So that's being worked on right now. What we could use is more resources, both Federal and State, to expand the water systems and water supplies.

I think we could also use federal assistance in taking and summarizing historical developments of these areas that we have found to be contaminated and polluted, so that we can learn from that both geologically and economically, and maybe develop ordinances for land use, land use ordinances, either on a statewide basis on how to do development and the expansion of development—maybe not based upon individual water supplies, but public water supplies.

[The prepared statement of Mr. Kauffman follows:]

# TESTIMONY FOR PRESENTATION BEFORE THE SUBCOMMITTEE ON ENERGY AND NATURAL RESOURCES REGARDING GROUNDWATER RESOURCES AND RELATED MANAGEMENT AND REGULATORY ACTIVITIES

September 14, 1987

Prepared by:
CHARLES I. KAUFFMAN, JR.
HEALTH OFFICER

The County of Ocean is particularly interested in and protective of its groundwater aquifers as the Cohansey and Kirkwood aquifers are its primary reservoir of public and private water supplies. These aquifers are also the underlying sources of water for the New Jersey Pinelands and must be preserved as a protection for this unique area.

The County of Ocean has participated in the Federal 208 Water Quality Planning Program, a program with the U.S. Geological Survey Team, and to the State and Federal Projects including the ten (10) lists of Superfund sites that are located in Ocean County. In 1979 under new state legislation, the Ocean County Board of Chosen Freeholders created the Ocean County Board of Health.

The Ocean County Board of Health has the privilege to create county-wide environmental ordinances and has adopted a far reaching regulation to protect our precious groundwater supply. One ordinance not only regulates wells and septic systems throughout the County, but also requires extensive water testing for a wide range of volatile organics, and heavy metals in addition to bacteria. This analysis must be completed on each new well that is installed and on resales of property utilizing an individual well as a water supply.

Although this ordinance has only been in effect since May, 1987, four (4) areas of contamination have been located affecting hundreds of people and almost 100 homes. It is hoped that working in cooperation with the New Jersey Department of Environmental Protection that the sources of these areas of contamination will be found enabling the groundwater to be restored with the cost being borne by the polluter.

The Ocean County Board of Health also adopted an ordinance in 1983 "Prohibiting the Discharge of Hazardous Substances into the Surface or Groundwater within the County of Ocean." Both regulations have been effective in controling and prohibiting continued pollution of our resources and is recommended for other local areas that may have similar geographical formations.

Enclosures:

1) Ordinance 83-2 "An Ordinance Prohibiting the Pollution of the Surface and Groundwaters within the County of Ocean and Further Prohibiting the Discharge of Hazardous Substances into the Surface or Groundwater within the County of Ocean."

2) Ordinance 87-1 "An Ordinance of the Ocean County Board of Health Regulating the Location, Construction, Alteration, Inspection, Testing and Use of Wells and Individual Sewage Disposal Systems within the County of Ocean, State of New Jersey."

# ORDINANCE #83-2

AN ORDINANCE PROHIBITING THE POLLUTION OF THE SURFACE AND GROUND WATERS WITHIN THE COUNTY OF OCEAN AND FURTHER PROHIBITING THE DISCHARGE OF HAZARDOUS SUBSTANCES INTO THE SURFACE OR GROUND WATER WITHIN THE COUNTY OF OCEAN.

WHEREAS, the public health and welfare has been threatened in the County of Ocean because of the introduction of pollution and hazardous substances on the ground and into the surface and ground water of the County; and

WHEREAS, injury has been caused to the streams and underground water supply of the County of Ocean by said pollution and hazardous substances and will continue to be caused to said streams and underground water supply unless abated;

and

WHEREAS, other remedies such as enforcement through existing statutes and State or Federal agencies are insufficient because of the limited scope of the remedy offered or the great delay in obtaining enforcement of relief; and

WHEREAS, the Ocean County Board of Health is empowered to pass ordinances to protect the public water supply and prevent the pollution of the ground and surface waters of Ocean County and to prevent the use of or to close any well, the water of which is polluted or detrimental to the public health; and

WHEREAS, the Ocean County Board of Health is further empowered to enforce the making of returns or reports to the

Ocean County Health Department on the part of any person charged with such duty under any law and to take cognizance of any failure to make such returns and reports and deal with the same in an effective manner; and

WHEREAS, the Ocean County Board of Health is further empowered to prohibit any nuisances, offensive matter, foul or noxious odors, gasses or vapors which are injurious to the health of the inhabitants of the County of Ocean and order the abatement of such action.

NOW, THEREFORE, BE IT ORDAINED by the Ocean County Board of Health, State of New Jersey as follows:

SECTION 1. Short Title. This Ordinance shall be known as the Ocean County Board of Health Pollution Control and Hazardous Substances Ordinance.

SECTION 2. Definitions. For the purpose of this Ordinance, the following words and phrases when used herein shall be defined as follows:

A. The term "person" shall mean and include any person, firm, partnership, corporation or association.

B. The phrase "water pollution" shall mean the presence in or upon the surface or ground waters of the County of Ocean of one or more contaminants, including any form of solid or liquid waste of any composition whatsoever, in such quantities and duration as are, or tend to be, injurious to the human health or welfare, animal or plant life, or property, or would unreasonably interfere with the enjoyment of life or property within any portion of the County of Ocean.

C. The phrase "Hazardous substances" shall mean such elements and compounds including, but not limited to petroleum products, which are defined as such by the New Jersey Department of Environmental Protection, which shall include the list of Hazardous substances adopted by the Federal Environmental Protection Agency pursuant to Section 311 of the Federal Water Pollution Control Act Amendments of 1977, 33 U.S.C. 1251 et seq., and the list of toxic pollutants designated by Congress or the EPA pursuant to Section 307 of said Act.

D. The term "discharge" shall mean any intentional or unintentional action or omission resulting in the relasing, spilling, leaking, pumping, pouring, emitting, emptying or dumping of hazardous substances into the ground or surface waters of the County of Ocean or onto lands from which it might flow or drain into said waters, excepting discharges pursuant to and in compliance with the conditions of a valid Federal or State permit.

SECTION 3. Prohibition against Polluting.

A. No person shall pollute or permit to be polluted any stream of water or well, the water of which is used for domestic purposes, or any well, spring, stream, lake or any body of water in such manner as to cause or threaten injury to any of the inhabitants of the County of Ocean, either in health, comfort or property, or to cause or threaten degradation of water quality resulting in damage to the aquatic community or wildlife in and adjacent to the affected body of water.

B. All persons shall maintain their premises, storage and other facilities so as to prevent water pollution from gaining access to any stream of water or well, the water of which is used for domestic purposes, or any well, spring, stream, lake or any body of water whether designated as ground or surface water in such manner as to cause or threaten injury to any of the inhabitants of this County, either in health, comfort or property, or to cause or threaten degradation of water quality resulting in damage to the aquatic community or wildlife in and adjacent to the affected water body.

SECTION 4. Discharge of Hazardous Substances Prohibited. Allowing a discharge of a hazardous substance into the ground or surface waters of the County of Ocean or to remain upon the ground so that it could enter into the surface or ground water of the County of Ocean is prohibited.

SECTION 5. All Discharges of Hazardous Substances to be Reported. Any discharge of a hazardous substance shall be reported by the owner, operator or person in charge of any facility or vehicle from which the discharge occurs to the Ocean County Health Department immediately upon its occurrence, by telephone. Within twenty-four (24) hours of the telephone report, the owner, operator or person in charge shall submit to the Ocean County Health Department a written report setting forth the time, place, date, persons present, with addresses and details of the discharge of the hazardous substance. These reports shall set forth the amount of the discharge, a thorough description of the hazardous substance, the proposed method of abatement and the estimated cost of the removal of the hazardous substance. A report of all steps being taken to clean up the discharge shall be filed every seventy-two (72) hours thereafter until the Ocean County Health Department determines that the discharge has been correctly abated. The requirement for follow up reports may be waived in writing, by the Ocean County Health Department.

SECTION 6. Access to Facility and Records. The owner, operator or person in charge of the facility or vehicle wherein or from which a discharge of a hazardous substance occurs shall provide access to the area and records involving the discharge and the substance discharged to the agents and employees of the Ocean County Health Department for the purpose of taking samples, photographs, photocopies of documents and statements from witnesses as to the discharge or substance discharge.

SECTION 7. Discharge is to be Removed or Contained. The owner, operator or person in charge of the facility or vehicle from which the discharge of hazardous substances occurs shall take all steps necessary to stop the discharge and remove or contain the hazardous substance so that under no circumstances can it reach the public water supply or pollute the surface or ground waters of the County of Ocean.

SECTION 8. Right of Inspection.

A. For the purpose of enforcement of this Ordinance, the Ocean County Health Department, its employees and agents may inspect business, agricultural, commercial, industrial, and/or landfill sites and shall be permitted to enter upon such public and private property and examine, test and take samples of any and all substances which may affect ground or surface water, including but not limited to water, solid materials, soil, spills, subsurface disposal systems underground and above ground storage tanks, and discharges of any nature into the air, ground or otherwise.

B. For the purpose of enforcement of this Ordinance, the Ocean County Health Department, its agents and employees may require that information be provided to the Department by the owner or occupant of a business, agricultural, commercial, industrial, landfill or other site regarding chemicals used, produced and/or disposed of at said site including but not limited to:

(1) All information made available to the State of New Jersey Department of Environmental Protection or the United States Environmental Protection Agency;

(2) Quantity;

(3) Trade name;

(4) Generic name;

(5) Method of storage;

(6) Method of disposal;

(7) Any other persons or parties involved in disposal;

(8) On-site treatment facilities for waste products.

In the event the information requested is a trade secret, or samples made by the Ocean County Health Department are trade secrets, such information shall be restricted and revealed only to those parties whose knowledge of such information is necessary for the enforcement of this Ordinance.

### SECTION 9. Registration.

A. Every owner or occupant of a business, agricultural, commercial, industrial, landfill or other site storing hazardous materials in quantities totaling more than fifty-five (55) gallons liquid volumn or twenty-five (25) pounds dry weight shall register with the Ocean County Health Department the types, quantities, location and method of storage and disposal of said hazardous substances. However, the registration requirement of this sub-section shall not apply to any site used exclusively for residential purposes. The registration statement required by this provision shall be initially submitted to the Ocean County Health Department within ninety (90) days after the effective date of this Ordinance and annually thereafter within thirty (30) days of January 1 of each calendar year.

B. In addition to submitting the registration statement required by Subsection A of this Section, the owner or occupant of a business, agricultural, commercial, industrial, landfill or other site for which a registration statement is required under Subsection A above shall maintain on the premises an inventory, reconciled on a monthly basis of the purchase, use, sale and disposal of all hazardous substances. The purpose of this account is to detect any product loss and to provide an ongoing record of all quantities of hazardous materials within the County of Ocean over the registration threshold.

SECTION 10. Procedure for Search Warrant.

If the owner of the premises refuses to permit entry to the Ocean County Health Department, its agents or employees for the purposes set forth in this Ordinance, the Department may apply to the municipal court judge of the municipality within which the premises are located for a search warrant.

The application shall be based upon an affidavit setting forth that the entry, examination, test or sample is for the purposes set forth in this Ordinance, and that conditions and circumstances provide a reasonable basis for believing that such entry, examination, test or sample may enable the Ocean County Health Department or any other governmental agency to protect the public water supply or prevent the pollution of the ground waters or surface waters of the County of Ocean. If the judge is satisfied as to the matter set forth in the affidavit, he shall authorize the issuance of a search warrant permitting access to the premises for those purposes set forth in this Ordinance.

## SECTION 11. Power to Close Well.

A. In the event it is determined by the Ocean County Health Department that the water in any well is polluted or detrimental to the public health, it is herewith empowered to prevent the use of or close said well.

B. All water testing laboratories shall report to the Ocean County Health Department, within three (3) working days, all testing results of public and private water supplies, including wells, located in Ocean County that:

(1) Reveal the existence of priority pollutants as designated by the United States Environmental Protection Agency; and

(2) Exceed the current maximum contaminant level of the national interim primary drinking water standards of the Safe Drinking Water Act (P.L. 93-523, 40 FR 11990, 1975). In the event that a substance constitutes a priority pollutant under Subsection 1 above as

well as a contaminant under Subsection 2 above, the testing results shall be reported to the Ocean County Health Department only if they see they exceed the current maximum contaminant level set forth in Subsection 2 above.

SECTION 12. Order to Cease and Desist, Abatement and Injunctive Relief. In the event it is determined by the Ocean County Health Department that any person is doing or permitting any act which is polluting the surface or ground waters of the County of Ocean in such a manner as to cause or threaten injury to any of the inhabitants of the County of Ocean, either in health, comfort or property, or to cause or threaten degradation of the water quality of the ground or surface waters of the County of Ocean resulting in damage to the aquatic community or wildlife in and adjacent to the affected waters, the Ocean County Health Department may order such person or persons to cease and desist from the continuance of such act or the continuance of permitting such act. In addition, the Ocean County Health Department may order such person or the owner of the subject premises to abate the said pollutant within such time as the Ocean County Health Department may specify. In addition to any other remedies, the Ocean County Health Department may institute an action in the Superior Court for injunctive relief.

SECTION 13. Non-Limiting Provision. Nothing contained herein shall be deemed to limit the Ocean County Health Department from exercising any other right or power granted by the Federal, State or local government to effectuate the purpose of this Ordinance or to protect the health of the community.

SECTION 14. Severability. In the event that any section, sentence or clause of this Ordinance shall be deemed unconstitutional or invalid by a court of competent jurisdiction, such declaration shall not in any manner prejudice the enforcement of the remaining sections.

SECTION 15. Violations and Penalties.

A. In addition to any other liability or penalty imposed by law, any person violating any provision of this Ordinance shall, upon conviction thereof, be subject to a penalty of not less than One hundred ($100.00) dollars nor more than Five hundred ($500.00) dollars for each offense.

B. Each and every day in which a violation of any of the provisions of this Ordinance exists shall constitute a separate violation.

SECTION 16. Inconsistent Ordinances Repealed. All Ordinances or parts of Ordinances which are inconsistent with the provisions of this Ordinance are hereby repealed to the extent of such inconsistency.

SECTION 17. Effective Date. This Ordinance shall take effect upon final adoption and publication in accordance with the provisions of N.J.S.A. 26:3-69 and N.J.S.A. 26:3A2-27.

## NOTICE

NOTICE IS HEREBY GIVEN that the foregoing Ordinance was duly introduced and passed on first reading at a regular meeting of the Ocean County Board of Health, State of New Jersey held on the 16th day of February, 1983. Further notice is given that said Ordinance will be considered for final passage and adoption at a regular meeting of said Ocean County Board of Health to be held at the Ocean County Health Department, Sunset Avenue, Toms River, New Jersey at 8 o'clock p.m. on the 16th day of March, 1983, at which time and place any person interested therein will be given an opportunity to be heard.

Robert Singer, Secretary
Ocean County Board of Health

# ORDINANCE #83-2

AN ORDINANCE PROHIBITING THE POLLUTION OF THE SURFACE AND GROUND WATERS WITHIN THE COUNTY OF OCEAN AND FURTHER PROHIBITING THE DISCHARGE OF HAZARDOUS SUBSTANCES INTO THE SURFACE OR GROUND WATER WITHIN THE COUNTY OF OCEAN.

PUBLIC NOTICE is hereby given that the ordinance entitled as above was finally passed and adopted at a regular meeting of the Board of Health of Ocean County held on March 16, 1983.

I certify the foregoing to be a true copy of an Ordinance adopted by the Ocean County Board of Health on the

16th day of March, 1983

Secretary

## ORDINANCE 87 - 1

### AN ORDINANCE OF THE OCEAN COUNTY BOARD OF HEALTH REGULATING THE LOCATION, CONSTRUCTION, ALTERATION, INSPECTION, TESTING AND USE OF WELLS AND INDIVIDUAL SEWAGE DISPOSAL SYSTEMS WITHIN THE COUNTY OF OCEAN, STATE OF NEW JERSEY

WHEREAS, the Ocean County Board of Health deems it absolutely necessary to protect the public health and public water supply and to prevent the pollution and contamination of this precious resource; and

WHEREAS, the public health and welfare has been threatened in the County of Ocean because of the introduction of pollution and hazardous substances on the ground and into the surface and groundwater of the County; and

WHEREAS, injury has been caused to the streams and underground water supply of the County of Ocean by said pollution and hazardous substances and will continue to be caused to said streams and underground water supply unless abated; and

WHEREAS, N.J.S.A. 26:3A2-5(c) provides that a County Board of Health shall exercise within the area of its jurisdiction all of the powers granted to a local board of health under N.J.S.A. 26:3-1 et seq.; and

WHEREAS, N.J.S.A. 26:3-31(a) empowers the Ocean County Board of Health to pass ordinances to protect the public water supply and prevent the pollution of any stream of water or well, the water of which is used for domestic purposes, and to prevent the use of or to close any well, the water of which is polluted or detrimental to the public health; and

WHEREAS, in N.J.S.A. 26:3A2-22 the Legislature has declared it the policy of this State to provide for the administration of Environmental Health Services by County Departments of Health throughout the State, which services shall include the enactment, monitoring and enforcement of Environmental Health Ordinances on a County-wide basis; and

WHEREAS, N.J.S.A. 26:3A2-27 further empowers the Ocean County Board of Health to adopt and enforce Environmental Health Ordinances for the territorial area of the County, including ordinances relating to the control of water pollution; and

WHEREAS, the Legislature has provided in N.J.S.A. 58:11-25 that a County Board of Health may adopt standards for the construction and certification of wells and individual sewage disposal systems which are more stringent than existing State Standards; and

WHEREAS, N.J.S.A. 58:12A-16 of the New Jersey Safe Drinking Water Act, further charges a County Board of Health with the responsibility of developing procedures for the testing of individual homeowner wells; and

WHEREAS, N.J.A.C. 7:10-12.31(b)(2) and (3) of the New Jersey Safe Drinking Water Regulations provide a County Board of Health with discretion in testing nonpublic water systems to determine the acceptability of said water supply; and

WHEREAS, over the past few years, numerous wells within the County have been found to contain hazardous contaminants and substances inimicable to the public health and welfare; and

WHEREAS, the Ocean County Health Department in conjunction with the New Jersey Department of Environmental Protection has found it necessary to prohibit the construction of individual wells and to require the closure of existing wells in certain areas of the County due to said contamination; and

WHEREAS, the Ocean County Board of Health believes it is in the best interest of the residents of Ocean County to regulate the location, construction, inspection, alteration, testing and use of individual wells and sewage disposal systems; and

WHEREAS, the testing of wells will assist the Ocean County Board of Health in determining the existence and migration of pollution and hazardous substances in the surface and groundwaters of the County of Ocean.

NOW, THEREFORE, BE IT ORDAINED by the Ocean County Board of Health, State of New Jersey, as follows:

SECTION 1; Definitions:

The words, terms and phrases used in this Ordinance shall be defined and have the same meanings as set forth in N.J.A.C. 7:9-2.4 and N.J.A.C. 10:12-4 except as set forth below:

Act. The New Jersey Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq., as amended and supplemented from time to time.

Administrative Authority. The administrative authority for the purpose of the Ordinance is the Ocean County Board of Health, except that the local Board of Health shall be the administrative authority for the purpose of granting variances under N.J.A.C. 7:9-2.19 and N.J.A.C. 7:10-12.13.

Authorized Agent. The authorized agent for the purposes of this Ordinance is the Ocean County Health Department.

Lot. A designated parcel, tract or area of land established by a plat or as otherwise permitted by law.

Nonpotable Water Supply. Any water not used or intended to be used to a potable water supply and permanently identified as such.

Plat. A map or maps of a subdivision or site plan.

Potable Water Supply. Any water used or intended to be used for drinking, bathing, culinary or other personal contact purposes.

Regulations. The New Jersey Safe Drinking Water Regulations, N.J.A.C. 7:10-1 et seq., as amended and supplemented from time to time.

Sale. Fee simple title is passed from one person or legal entity to another person or legal entity by deed or other means of conveyance.

Transfer. A change of possession from one party to another party either by lease or otherwise for a period in excess of six (6) months.

SECTION 2. Permit Required; Installation of Wells:

A. No person shall locate, construct or alter any well within the County of Ocean until a permit for the location, construction and/or alteration of said well has been issued by the Ocean County Health Department.

B. The Ocean County Health Department may issue a permit for the location, construction and/or alteration of a well subject to the following conditions:

(1) A completed application form is submitted to the Ocean County Health Department together with a design plan prepared in accordance with the requirements and standards set forth in N.J.A.C. 7:10-12.1 et seq. as amended and supplemented from time to time.

(2) Where the lot upon which a new well is proposed to be located or an adjacent lot is served by an individual sewage disposal system, the design plan shall be prepared by a Professional Engineer, licensed to practice in the State of New Jersey, and bear his raised seal and certification. Said plan may indicate a bounded area or zone for the location of a well which complies with the minimum setback requirements contained in N.J.A.C. 7:10-12.1 et seq., as amended and supplemented from time to time.

(3) Where the lot upon which a new well is proposed to be located and all adjacent lots are served by a public sanitary sewage disposal system, the well design plan may be prepared and submitted by a well driller licensed by the New Jersey State Well Drillers Examining and Advisory Board.

(4) For the alteration or replacement of an existing well, the design plan may be prepared by a well driller licensed by the New Jersey State Well Drillers Examining and Advisory Board.

(5) The appropriate fee, as set forth in Section 13 of this Ordinance, has been paid.

C. Any permit issued hereunder shall become invalid if the authorized work is not commenced and completed within twelve (12) months after issuance of the permit.

SECTION 3. Permit Required; Individual Sewage Disposal System:

A. No person shall locate, construct or alter any individual sewage disposal system within the County of Ocean until a permit for the location, construction and/or alteration of said system shall have been issued by the Ocean County Health Department.

B. The Ocean County Health Department may issue a permit for the location, construction and/or alteration of an individual sewage disposal system subject to the following conditions:

(1) A completed application form is submitted to the Ocean County Health Department together with a design plan prepared in accordance with the requirements and standards set forth in N.J.A.C. 7:9-2.1 et seq. as amended or supplemented from time to time.

(2) The design plan shall be prepared by a Professional Engineer, licensed to practice in the State of New Jersey, and bear his certification and raised seal. Said Engineer shall be responsible for the physically staking out or otherwise marking the location of the individual sewage disposal system on the property.

(3) Upon application, the Ocean County Health Department may waive the requirement for certified engineering design plans for alterations or repairs to individual sewage disposal systems serving a single family residential dwelling.

(4) The appropriate fee, as set forth in Section 13 of this Ordinance, has been paid.

C. Any permit issued hereunder shall become invalid if the authorized work is not commenced and completed within twelve (12) months after the issuance of the permit.

SECTION 4. Denial of a Permit:

The issuance of a permit may be denied for any of the following reasons:

A. The application or design plan submitted for the location, construction and/or alteration of a well does not comply with the requirements and standards set forth in N.J.A.C. 7:10-12.1 et. seq., as amended and supplemented from time to time;

B. The application or design plan submitted for the location, construction and/or alteration of an individual sewage disposal system does not comply with the requirements and standards set forth in N.J.A.C. 7:9-2.1 et seq., as amended and supplemented from time to time;

C. The application or design plan submitted is deemed incomplete by the Ocean County Health Department. In the event an application or design plan is deemed incomplete, the Ocean County Health Department shall advise the applicant in writing of any and all deficiencies;

D. A public community water supply system is presently available to serve the property upon which a well is proposed to be located and constructed, except where the well is intended to be used as a nonpotable water supply and is identified as such;

E. A public sanitary sewage disposal system is presently available to serve the lot upon which an individual sewage disposal system is proposed to be located and constructed.

F. The installation, use and/or operation of the well or individual sewage disposal system is prohibited by federal, state or local law, regulation or order.

SECTION 5. Final Certification of Wells and Individual Sewage Disposal Systems:

No well or individual sewage disposal system shall be placed into operation or use until the Ocean County Health Department has issued a certificate indicating that said well or individual sewage disposal system has been located, constructed and/or altered in compliance with the terms of the permit issued and the requirements and standards set forth and incorporated in this Ordinance.

SECTION 6. Granting of Final Certification:

The Ocean County Health Department may grant final certification of a well or individual sewage disposal system provided the following requirements are met:

A. The well or individual sewage disposal system has been located, constructed and/or altered in compliance with the approved design plan and permit issued by the Ocean County Health Department and the requirements and standards set forth and incorporated in this Ordinance.

B. Where the installation or location of the well or individual sewage disposal system deviates from the approved design plan, an "as built" plan shall be submitted by a Professional Engineer, licensed to practice in the State of New Jersey, together with the engineer's certification that the well and/or individual sewage disposal system is constructed and installed in accordance with all requirements and standards set forth and incorporated in this Ordinance.

C. Where the design plan submitted by a Professional Engineer establishes a bounded area or zone for the location of a well, an "as built plan" shall be submitted by either a Professional Engineer or a licensed well driller showing the actual location of the well.

D. Where the design plan for the location and construction of a well has been submitted by a well driller, licensed by the New Jersey State Well Driller Examining and Advisory Board, the well driller shall certify to the Ocean County Health Department in writing that the well has been located, constructed and installed in accordance with the design plan previously submitted to the Ocean County Health Department and in accordance with all requirements and standards set forth and incorporated in this Ordinance.

E. In the case of the location and construction of a new well, the laboratory analysis of a water sample collected and analyzed in accordance with Sections 7, 8 and 9 of this Ordinance does not disclose the presence of any of the hazardous contaminants or substances set forth in Section 8A of this Ordinance in an amount which exceeds the maximum contaminant level established under the Act, the Regulations or this Ordinance for the same or, if no maximum contaminant level has yet to be established, the Level I, Interim Action Level concentration for the same established by the New Jersey Department of Environmental Protection, Division of Water Resources.

F. All fees due and payable to the Ocean County Health Department under Section 13 of this Ordinance have been paid in full.

G. The installation, use and/or operation of the well or individual sewage disposal system is not otherwise prohibited by federal, state or local law, regulation or order.

H. The use or operation of the well or individual sewage disposal system does not otherwise pose an actual or potential health hazard to the owner of the property in question or the public in general.

### SECTION 7. Individual Wells; Collection of Water Samples:

A. Before final certification and operation of a new well, other than an exempt well as defined in Subsection B of this Section, the person owning the lot upon which a new well is located and constructed shall have a sample of the well water collected and analyzed by a laboratory certified by the New Jersey Department of Environmental Protection pursuant to N.J.A.C. 7:18-1.1 et seq. to conduct testing for the individual hazardous contaminants and substances set forth in Section 8A of this Ordinance. The water sample shall be taken as close to the pumping well as possible. If a sample must be taken following a treatment unit, the type, size and purpose of the unit shall be reported along with the test results. In no case shall treatment equipment be installed on a new well prior to the first sampling. The results of said laboratory analysis shall be forwarded directly by the laboratory to the Ocean County Health Department.

B. The following nonpotable water supply wells shall be exempt from the sampling and analysis requirements established under Sections 7, 8 and 9 of this Ordinance:

(1) Any nonpotable well, the pumps and lines of which do not enter a building, crawlspace or garage and are directly connected to a sprinkler system manifold;

(2) Geothermal groundwater heat pump wells that are constructed and installed as totally enclosed systems and are incapable of being used as a potable water supply;

(3) Fire protection wells as defined in the State Uniform Construction Code, N.J.A.C. 5:23-1.1 et seq., which are incapable of being used as potable water supply.

### SECTION 8. Individual Wells; Testing Procedure:

A. The water sample collected under Section 7 of this Ordinance shall be analyzed by a laboratory certified by the New Jersey Department of Environmental Protection pursuant to N.J.A.C. 7:18-1.1, et seq., to determine whether any of the following hazardous contaminants and substances are present in amounts which exceed the maximum contaminant levels established under the Act and the Regulations for the same; or if no maximum contaminant level has yet to be established, the Level I, Interim Action Level concentration for the same established by the New Jersey Department of Environmental Protection, Division of Water Resources:

Turbidity;
Bacteria (total coliform);
Nitrates;
Iron;
Manganese;
pH,
Arsenic;
Cadmium;
Chromium;
Lead;
Mercury;
Benzene;
Carbon Tetrachloride;
Chlorobenzene;
Dichlorobenzene(s);
1,2-Dichloroethane;
1,1-Dichloroethylene;
trans-1,2-Dichloroethylene;
Methylene Chloride;
Tetrachloroethylene;
1,1,1-Trichloroethane;
Trichloroethylene;
Vinyl Chloride;
Xylene(s);
Sodium;
Chlordane (for resales under Section 10 only).

For potable water supplies, the maximum contaminant level for pH is hereby fixed as not less than 6.5 and not greater than 8.5.

B. All water samples shall be collected, tested and analyzed in accordance with criteria and procedures established by the New Jersey Department of Environmental Protection in N.J.A.C. 7:18-2.1 et seq. Upon request by the Ocean County Health Department, the laboratory submitting the test results shall submit proof that it is certified by the New Jersey Department of Environmental Protection pursuant to N.J.A.C. 7:18-1.1 et seq. to conduct the tests necessary to determine the presence of the hazardous contaminants and substances set forth in Section 8A of this Ordinance.

C. In the event that the laboratory analysis of a water sample collected from a new well reveals the presence of any of the hazardous contaminants or substances identified in Section 8A of this Ordinance in an amount exceeding the maximum contaminant levels set forth or incorporated in this Ordinance for the same, the Ocean County Health Department must be notified prior to resampling the well for the purpose of determining resampling procedures.

### SECTION 9. Individual Wells: Submission of Water Analysis Data:

The laboratory collecting the sample and performing the water analysis required under Sections 7 and 8 of this Ordinance shall submit the results of its analysis directly to the Ocean County Health Department with the following information:

a. The lot number, block number and municipality of the property upon which the well is located and the reason for the sample (i.e., new construction or resale);

b. The name and mailing address of all persons owning the property upon which the well is located;

c. The laboratory employee or the laboratory's authorized representative who physically collected the sample from the well;

d. The date and time that the well sample was collected;

e. The specific point of collection of the water sample; and

f. The date and time the sample was analyzed by the laboratory.

### SECTION 10. Sale or Transfer of Ownership of Real Property Upon Which a Well is Located:

No real property nor any interest in the same shall be sold or transferred after July 1, 1987 which utilizes a well for its potable water supply until:

a. The well water has been sampled and analyzed in accordance with the procedures set forth in Sections 7, 8 and 9 of this Ordinance; and

b. The Ocean County Health Department has certified that the laboratory analysis of the water sample collected from said well does not disclose the presence of any of the hazardous contaminants or substances set forth in Section 8A of this Ordinance in an amount which exceeds the maximum contaminant level established under the Act, the Regulations or this Ordinance for the same or, if no maximum contaminant level has yet to be established, the Level I Interim Action Level concentration for the same established by the New Jersey Department of Environmental Protection, Division of Water Resources.

c. The granting of final certification by the Ocean County Board of Health shall be a valid certification until there is a sale or transfer of the property in question where that sale or transfer is more than six (6) months after the issuance of said final certification. In the event said sale or transfer is within six (6) months or less from the preceding certification, the transferor need not obtain a new certification.

### SECTION 11. Right of Entry:

The Ocean County Health Department shall have access and entry to any property upon which there is located a well or individual sewage disposal system for the purpose of inspecting and/or testing the same.

### SECTION 12. Order to Close:

The Ocean County Health Department may order any well which is determined to be polluted or detrimental to the public health closed until and unless the water is made potable.

### SECTION 13. Fees:

The following fees are hereby established:

| | | |
|---|---|---|
| A. | For filing of an application and design plan for the issuance of a permit to locate and construct a well and individual sewage disposal system on the same lot. | $75.00 |
| B. | For filing of an application and design plan for the issuance of a permit to locate and construct an individual sewage disposal system on a lot. | $50.00 |
| C. | For filing an application and design plan for the issuance of a permit to locate and construct a well on a lot. | $25.00 |
| D. | For filing an application and design plan for the issuance of a permit to alter or replace an existing well or individual sewage disposal system on a lot. | $25.00 |
| E. | For final inspection of a well or individual sewage disposal system by the Ocean County Health Department pursuant to this Ordinance. | $25.00 |
| F. | For each reinspection of a well or individual sewage disposal system caused by the failure of the permittee to locate, construct or alter the same in accordance with the terms of the permit issued or the requirements and standards set forth and incorporated in this Ordinance. | $25.00 |
| G. | For certification of a water sample analysis by the Ocean County Health Department without an onsite inspection. | $25.00 |
| H. | For review of subdivision maps or site plans. | $50.00 |
| I. | For any requested inspection of a well or individual sewage disposal system not covered above. | $25.00 |
| J. | For filing a modification or change to the application or design plan for a well or individual sewage disposal system. | $25.00 |

### SECTION 14. Existing Permits:

Any permit for the location, construction and/or alteration of a well or individual sewage disposal system issued prior to the effective date of this Ordinance shall remain valid and all work authorized by the permit may be completed pursuant to said permit provided the same is completed within twelve (12) months after effective date of this Ordinance.

### SECTION 15. Severability:

In the event that any section, sentence or clause of this Ordinance shall be deemed unconstitutional or invalid by a court of competent jurisdiction, such declaration shall not in any manner render void or prejudice the enforcement of the remaining sections of this Ordinance.

### SECTION 16. Violation and Penalties:

A. In addition to any other liability or penalty imposed by law, any person violating any provision of this Ordinance shall be subject to a penalty of not less than One Hundred ($100.00) Dollars nor more than Five Hundred ($500.00) Dollars for each offense;

B. Each and every day in which a violation of any of the provisions of this Ordinance exists shall constitute a separate offense.

### SECTION 17. Inconsistent Ordinances Repealed:

All ordinances or parts of ordinances which are inconsistent with the provisions of this Ordinance are hereby repealed to the extent of such inconsistency. Pursuant to N.J.S.A. 26:3A2-27, this Ordinance supersedes all inconsistent municipal and local board of health ordinances regulating the same subject matter.

### SECTION 18. Effective Date:

This Ordinance shall take effect upon final adoption and publication in accordance with the provisions of N.J.S.A. 26:3A2-27.

### SECTION 19. Short Title:

This Ordinance shall be known as the "Ocean County Board of Health Well and Individual Sewage Disposal System Ordinance."

Senator **Bradley**. Well, as you heard today, we have a program which is just beginning to grow, and the State said they would like it and the U.S.G.S. said they had additional resources. So maybe we can match the State's money and the U.S.G.S. resources, and we will be able to do some of these things that you have suggested.

Let me thank all three of the witnesses for your testimony. I think it has been extremely helpful, and I appreciate your taking the time today to offer it.

One last question to the general, and that is on the salt water intrusion. And here we are in Burlington City and there is the danger of salt water intrusion. Would you agree with U.S.G.S. that among the threats that the point contamination is greater than salt water intrusion?

General **Whipple**. I would have to agree with that. I think overall that is the major threat. We know what to do about salt water intrusion and a lot of the other problems of contamination have yet to be resolved.

Senator **Bradley**. Thank you very much.

Our next panel consists of two witnesses, Mr. William Haines, first vice president, New Jersey Farm Bureau, and Mr. Benjamin J. Miles, executive director, New Jersey Food Processors Association.

Let me welcome both of you gentlemen to the Subcommittee. I would appreciate it if you could summarize your testimony and let us ask a few questions. And if I have to cut you off, it is only because we went over too long in the initial witnesses.

Mr. Haines, welcome. Please begin.

## STATEMENT OF WILLIAM S. HAINES, JR., FIRST VICE PRESIDENT, NEW JERSEY FARM BUREAU

Mr. **Haines**. Good morning, Senator Bradley. I am here today representing New Jersey Farm Bureau, which is the largest farmer organization in New Jersey.

And I am also here representing myself, because I am not a staff person for the New Jersey Farm Bureau, but I am an active farmer, with cranberries and blueberries here in Burlington County. And in fact, we just started harvest today. So I am under some time constraint myself.

Secretary Brown summed up where agriculture stands pretty well. It is an important economic component in New Jersey. He summed up a lot of the problems, and one of them is low net income for farmers and the fact that the real estate value of the farm land is tremendously high.

But water is one of the most important issues facing agriculture. Besides the land use management, pesticide use, labor management, municipal regulations, water is a key. And as a cranberry grower, it is probably more important to me than other farmers, or at least I recognize its importance more, because we use it for frost protection, irrigation, and actually use it for harvest.

The harvest actually takes place in the water, and New Jersey cranberry growers have done a great deal to conserve water by building large reservoirs and impoundments, and we feel we do a great deal to naturally recharge the aquifer.

And we also have acquired quantities of land to protect our water supply, which benefits us because we need the quantity of water and we need the quality of water for our business, but also indirectly it has benefited the Pinelands area where we are located, and consequently all the people in the state, we feel.

In general, there are 80,000 acres of irrigated cropland in New Jersey and about 90 percent of this acreage is in the coastal plains. So it is, therefore, dependent on the ground water supply.

Farmers in New Jersey have generally enjoyed unimpeded access to the plentiful water supplies, with the exception of two recent drought emergencies in 1985. This situation is about to change, at least slightly and perhaps drastically. The State Department of Environmental Protection has begun the implementation of the critical area aquifer, which Mr. Dewling talked about.

Agriculture has escaped the effect of these cutbacks pretty much, because our wells do not reach the deep formations that are subject to restrictions. So only very few farmers have been directly restricted currently. But that regulatory tool is in place and it is therefore of potential use in the future.

Senator **Bradley**. How deep are your wells?

Mr. **Haines**. Most wells in New Jersey I would say, agricultural wells, are between 120 feet and 200 feet. On our farm we have four large wells and they are 180 to 200 feet.

Senator **Bradley**. And the critical area program affects what depth?

Mr. **Haines**. It does not affect our wells.

The State also has a water allocation certification program which has been in place since 1984, and which was put into effect in response to the 1983 drought situation.

Another significant source of potential water use controls which Secretary Brown mentioned was the user fees by the Delaware River Basin Commission. This is something that New Jersey Farm Bureau opposes, because it could hurt our farmers who irrigate their crops located in the basin. I myself am not in the basin.

Another problem in the future could come from competition from new or expanded uses in ground water sources that we have previously had pretty much to ourselves. And one example of this is what was mentioned by someone earlier about the county officials have—it is the hope that Gloucester County officials have perhaps of tapping into the Cohansey formation to make up for the 35-percent cutback as a result of the critical area designation.

Senator **Bradley**. Is that something you support?

Mr. **Haines**. No, we do not.

Some mention was made that that was not in the Pinelands area, and I would hate to get into a technical argument with the people here today who have spoken already. But in the Pinelands area, which you are familiar with, the purpose of that, one of the most important purposes for putting that into place, was to protect the water resources of the area, and the ecology of that area is very sensitive to any change in the groundwater levels.

And it just seems to me that there would have to be an extreme, extreme emergency for any kind of use of the Cohansey other than what is being used now. I just think that farmers and people in the Pinelands area would have to oppose that to the bitter end.

Senator **Bradley**. So is your point that it is a little bit like it is happening in the areas outside of an official boundary, but that it affects everything underneath and therefore under the boundary as well?

Mr. **Haines**. Exactly right. The Pineland plans basically are lines drawn on the map, and it seems to me that the Cohansey is the Cohansey, and if you mess with it in one place you are messing with it somewhere else.

Senator **Bradley**. As U.S.G.S. said, if you touch it at one place there is a reaction elsewhere.

Mr. **Haines**. That is so.

We feel strongly that farmers should not have to pay for the water. The economics of agriculture are such that we cannot pass along our cost increases, as a lot of businesses can. That is unfortunate, but that is the way it is.

Farmers perform a valuable function in water management through ground water recharge on open areas, which has also been mentioned. And I think cranberry growers do an even better job because of the nature of their business than most farmers because we have to have the large impoundments.

And another compelling reason for opposing fees in New Jersey is the fact that there are massive Federal water subsidies in the West, and those funds are used to build and maintain water projects that cost billions of dollars, not a dime of which has ever been received in New Jersey.

And what aggravates the situation is the fact that crops grown as a result of these projects frequently come to the Northeast and compete with our produce, or they end up adding to the huge surplus in our Federal farm programs.

I am sure there are benefits to the economies of the Western States from these projects, but we in New Jersey feel that we should not have to pay for water when others are so heavily subsidized.

I have hit pretty hard already on my point that you should not pump water from the Pinelands, and I guess I do not have to expand any more on that.

And I do not think that we can totally depend on conservation in New Jersey. I think this is kind of related to the business about water projects in the West. I think we have to build some new facilities, and I think that, as Secretary Brown said, we talked about the 48 inches of precipitation. Well, in New Jersey I think we basically depend upon that excess precipitation, particularly in north Jersey, for maintaining the reservoir level.

Well, there's a tremendous development movement, which affects agriculture in a lot of ways, and one is competition for waters. And it seems to me that with a population and business development increasing as much as it is in New Jersey—and it seems to be going in that direction for the foreseeable future—that some money ought to be spent to expand the supply, as Commissioner Dewling talked about, with the Massipon Reservoir.

And I think those programs ought to be expanded. I think conservation is important. As a farmer, I know that. But I do not think we can depend upon that to meet the needs. I think we are going to have to face up to the fact that we are going to have to find a way to expand our supplies.

Senator **Bradley**. So if you were advising DEP on what they should recommend for making up for the 35-percent conservation target for the PRM aquifer, are you saying no to Cohansey and you are saying probably yes out of the Delaware River, and maybe yes buying it from Philadelphia?

Mr. **Haines**. Yes.

New Jersey is evolving toward a water appropriation system. Our state has been taking some important steps since 1981 to get a handle on water management. Prior to that time, most of the regulated activity was concerned with well permits and a minimum of capital spending.

Since that time, a lot has changed, and the State can now boast of having one of the best ground water management programs in the Northeast.

As farmers, we believe we have more to gain than to lose by a sound water management program, and we have worked really hard as the Farm Bureau and as individual farmers to work with DEP and their division of water resources to develop water allocation certification systems.

I know I went around and around with General Whipple 3 years ago, and I think I have to admire him because I got a little hot under the collar because we were talking about my life, and he put up with that. And we worked out a system that I think shows how the Government and business can work together.

We have a certification system in which we report what we use from our wells. We have—we indicate to them what surface water sources we use, so they have a lot better handle on whatever agriculture is actually using. And the burden of that process is not unbearable to farmers. It is one that we can live with. And I think that is a good example of how that can work.

I would just like to touch real quickly on ground water quality regulation. We feel strongly that the ground water quality rules should be set by the health-based standards of protection, and not zero tolerance. As you can test—I mean, as the testing improves you can find more and more.

And we are real concerned that farmers are doing what they are supposed to do. As long as we buy the materials that we have to according to label standards, as long as we abide by any regulations that are in place, that if the standards are made more severe down the road what we have been doing for the past 10 years might not be acceptable and that we would end up with a real liability problem.

I think that we have—some way has to be found to protect us from that liability. I am not suggesting we could just indiscriminately use chemicals and fertilizers, but that if we do what we are doing, according to the best management practices im place, that we be protected.

The pollution liability for farmers and insurance is becoming a real issue, and most farmers are losing that protection. And it is real scarey, because you can be wiped out very quickly.

And I guess that wraps it up, Senator. I thank you for your time.

[The prepared statement of Mr. Haines follows:]

168 West State St., Trenton, New Jersey, 08608 tel. (609) 393-7163

TESTIMONY OF

WILLIAM S. HAINES, JR. - FIRST VICE-PRESIDENT
NEW JERSEY FARM BUREAU

TO

U. S. SENATE COMMITTEE on ENERGY and NATURAL RESOURCES
SUBCOMMITTEE on WATER and POWER

REGARDING

GROUNDWATER RESOURCES AND RELATED MANAGEMENT/
REGULATORY ACTIVITIES in NEW JERSEY

MONDAY, SEPTEMBER 14, 1987
BURLINGTON, N. J.

Agriculture
Keeps
New Jersey
Green

168 West State St., Trenton, New Jersey, 08608 tel. (609) 393-7163

TESTIMONY ON GROUNDWATER
September 14, 1987

Good day Senator Bradley and members of the subcommittee. I appreciate the opportunity of presenting a few remarks today about groundwater management in New Jersey. This statement is presented on behalf of New Jersey Farm Bureau, the state's largest farmer's organization which represents a large majority of the state's commercial growers. We consider groundwater management to be one of the most important policy areas for New Jersey farmers - along with land use management, pesticide use and regulation, labor management, and municipal regulations.

## NEW JERSEY AGRICULTURE

You should be aware that New Jersey agriculture is an industry whose gross receipts are expanding and now total about $600 million annually. The land base used in support of the industry has resumed a pattern of contraction. Some commodities producing an expanding dollar volume - nursery, fruit, and specialty crops are heavily dependent on ample water supplies for irrigation. Commodity groups experiencing the greatest loss of acreage are grain crops and dairy - which do not depend on irrigation in most instances. We expect the current trend of losing acreage from active cultivation to continue, due to low net income for many farmers and the strong real estate market that pervades New Jersey currently. There are other serious factors causing this conversion like competition from cheap foreign imports and crop shift into produce by grain farmers in other states - but that is a topic for another day.

## NEW JERSEY AGRICULTURE and WATER USAGE

Despite the fact that New Jersey has the greatest population density of any state in the nation, more than half the state consists of either farms or forests. Two-thirds of that population lives in only one-third of the state's land area. Agriculture represents approximately 920,000 acres or 17 percent of the state. About 600,000 acres of that total are actually cropped, most of which are devoted to grain crops and hay.

As of 1984, there are about 80,000 acres of irrigated cropland in New Jersey. More than 90 percent of this acreage is in the coastal plain, and therefore is dependent on groundwater supplies. Many of these farms supplement their well water with farm ponds of their own construction that store some surface water from stream flow. However, many of these streams are ground-water fed and should not be considered in the same sense as reservoirs or other impoundments that simply collect surface water run-off.

## COMMENTS on MANAGEMENT ISSUES

Farmers in New Jersey have generally enjoyed unimpeded access to plentiful water supplies, with the exception of two recent drought emergencies in 1985 and 1983. This situation is about to change at least slightly and perhaps drastically. The state Department of Environmental Protection has begun the implementation of "critical area aquifer" designations in two areas of the state because of excessive draw-down and reduced recharge. Agriculture has escaped the effect of these mandatory well usage cut-backs pretty much (because our wells do not reach the deep formations that are subject to the restrictions), but the regulatory tool is now in place for potential use in the future.

COMMENTS on MANAGEMENT ISSUES - Cont'd.

The state also has a "water allocation certification" program in place since 1984, with which we cooperate, but this could lead to further controls in the future. Another significant source of potential water use controls could come in the form of user fees by the Delaware River Basin Commission. This is something we oppose and could hurt all farmers who irrigate their crops located in the Delaware River Basin. Another problem in the future could come from competition by new or expanded uses in groundwater sources we have previously had pretty much to ourselves. One example of this is the hope Gloucester County officials have in making up most of their "critical area" cut-back from the outer reaches of the Cohansey formation.

So, it is clear that groundwater use by farmers in New Jersey is about to be modified by a series of changes already underway and a few that await us in the near future. I would like to outline a few points regarding this situation from our perspective for the benefit of the Subcommittee.

1. New Jersey farmers should not pay for water

   We feel strongly that we should not have to pay for water due to a variety of important factors. The economics of agriculture are such that we cannot pass along cost increases to the consumer; farmers are price takers, not price makers. Farmers perform a valuable function in water management through groundwater recharge on open, cultivated fields and by the many farm ponds and small impoundments on streams that cross their fields.

   Perhaps the most compelling reason for opposing fees in New Jersey lies in the fact of the massive federal water subsidies that are distributed out West. Federal funds used to build and maintain massive

New Jersey farmers should not pay for water - Cont'd.

water projects out West has cost billions of dollars, and not a dime of that has ever been received in New Jersey. What really aggravates the situation is the fact that crops grown as result of these projects frequently come into the Northeast and compete with our produce, or they end up adding to the huge surplus in our federal farm programs. While there may be some benefits to the economy of Western states from these projects, we in New Jersey do not want to pay for water when others are subsidized so heavily by the federal government.

2. DO NOT PUMP GROUNDWATER FROM THE PINELANDS

In 1979 and 1980, the federal and state government set up stringent land use controls for the protection of the Pinelands region in south Jersey. The purpose of this program which created the Pinelands National Reserve was to protect the fragile ecology of the region. The landowners in the area were severely disaffected by the rules, expecially the farmers who depend upon land values as their most important asset in their business.

As a cranberry and blueberry grower in the Pinelands, I can assure you that agriculture in the region is extremely water dependent. Pumping large amounts of groundwater from the Pinelands will adversely affect farming operations and it could damage the ecosystem as well. We can't do anything else with our land, so we do not want to have agriculture put at a disadvantage by such a change in water policy.

## New Jersey farmers should not pay for water - Cont'd.

### 3. Build new facilities rather than depend upon conservation

There is no question that New Jersey is in a precarious position in its water management system, what some hydrologists refer to as a dependence on "excess precipitation." Anytime rainfall patterns are less than average, we are susceptible to state-imposed restrictions on water usage. Hopefully, over the next few years, the state will continue to implement its Water Supply Master Plan and the situation will improve.

Some people say that the need for new reservoirs or other supply facilities is illusory, that all we have to do is conserve water and reduce per capita consumption and the problem will be solved. While we are proponents of water conservation practices, we believe that conservation is no substitute for expanding sources of water. Water is and will be a precious commodity in the future. Like any commodity, supply must be kept in sync with demand to keep New Jersey's economy healty.

### 4. New Jersey is evolving toward a water appropriation system

Our state has taken some important steps since 1981 to get a grasp on water management. Prior to that time, most of the regulated activity was concerned with well permits and a minimum of capital spending. Since that time, a lot has changed and the state can now boast of having one of the better groundwater management programs in the Northeast.

As farmers, we believe we have more to gain than lose by a sound water management program. New Jersey Farm Bureau encouraged its member farmers and the Extension Service to cooperate with the water allocation certification system, and have it serve constructively for farmers rather than view

4. New Jersey is evolving toward a water appropriation system - Cont'd.

it as a regulatory nuisance. Consequently, we have enjoyed a good relationship with the DEP and we commend them for their attitude in dealing with the private sector.

This management status promises to grow more complicated in the future. As mentioned, the "critical area" designations have some real teeth in their mandatory cut-backs. New Jersey has a well-documented problem with toxic material disposal, which in some cases threatens ground water supply. Continued economic growth in the state means more competition for water. All of this leads to the likelihood of more controls in the future. Agriculture must remain a priority use for water in the future.

5. Federal groundwater quality regulation

We are keenly aware of the bills now pending in Congress concerning groundwater quality. This is an area of regulation that has been shared and splintered among many agencies up until now. We are also aware of the attention being given to the issue of groundwater contamination from pesticides and fertilizers in rural areas.

Some important background work is underway by the Environmental Protection Agency in groundwater monitoring. These results should be carefully analyzed as a key input to any future regulation.

We feel strongly that groundwater quality rules should be set by health-based standards of protection and not zero-tolerance, non-degradation standards. The economic consequences of the latter for farmers are severe, and the gain of such stringent controls may not be necessary. Furthermore, the insurance liability issue related to any new, federally-imposed standards

5. Federal groundwater quality regulation - Cont'd.

will be a nightmare. It is entirely possible that liability insurance covering groundwater pollution will not be available for most farmers in the near future (if it isn't already), and such new rules will only aggravate that situation. Prudent regulations in this area is an absolute must.

SUMMATION

These are just a few of our thoughts presently on groundwater management. We appreciate your interest in the matter. The future of New Jersey agriculture is intertwined with the ready availability of ample supplies of water.

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Senator **Bradley**. Thank you very much, Mr. Haines, for your testimony and also for responding to questions.

Mr. Miles.

## STATEMENT OF BENJAMIN MILES, EXECUTIVE DIRECTOR, NEW JERSEY FOOD PROCESSORS ASSOCIATION, INC.

Mr. **Miles**. Thank you, Senator. Members of the Subcommittee, staff, ladies and gentlemen, the New Jersey Food Processors Association would like to commend the Subcommittee for holding these hearings to address ground water issues of importance to the State of New Jersey.

Our Food Processors Association is a trade association whose members are engaged in the processing and distribution of food and beverage products.

Processing plants for our member firms are located in the southern half of the State. Since most of the big large national food companies have closed their New Jersey processing operations, our members are typically the small, family-owned companies that have remained in the State.

The food industry utilizes large quantities of water in processing. Most processors use ground water supplies to satisfy their water requirements from either privately owned wells or purchased from local municipalities. High quality water is required for processing foods and frequently is an ingredient in many final products. Therefore, we are keenly interested in the protection of groundwaters, and any proposed regulation or legislation to deal with these issues.

There are many Federal regulations dealing specifically with ground water issues now. The Association urges that any subsequent legislation coordinates and maintains consistency among these laws.

For decades, the food processing industry has utilized land application for treatment of waste waters wherever suitable land is available. Currently about 50 percent of all waste waters generated by the industry are treated in land treatment systems. Properly designed and operated land treatment systems are effective, reliable, and environmentally sound.

Federal legislation provides incentives to initiate or expand land treatment of municipal waste water. The Clean Water Act encourages the recycling of potential waste water pollutants through agricultural, silvacultural, or aquacultural production. It also contains provisions which require municipalities to consider appropriate alternative waste management technology, such as land application, in order to receive Federal grants. EPA subsequently has encouraged the consideration of land application through the municipal construction grants program.

The New Jersey Food Processors Association is concerned that the current restrictions on land disposal of hazardous wastes may be inappropriately extended to encompass food processing waste. Our industry wastes are being effectively treated in well-managed treatment systems, without harm to the environment.

We endorse all efforts for prevention of ground water contamination, but we recommend that further legislation not place additional restrictions intended to control hazardous wastes on land treatment systems for food processing and other similar nonhazardous wastes.

We appreciate this opportunity to present these comments.

Senator **Bradley**. I would just like to ask you one question, Mr. Miles, and that is do you think that State and Federal ground water efforts up to this time have been helpful for your industry?

Mr. **Miles**. I think overall they have been helpful to the citizens of New Jersey, which include our citizens, yes.

Senator **Bradley**. But you are saying let us pause before we do any more?

Mr. **Miles**. I would like that, yes. I like the way you said it.

Senator **Bradley**. Thank you. Thank you very much.

Let me thank both of you for taking the time to be here.

Our last panel consists of Mr. Terrence Moore of the Pinelands Commission and Ms. Peggy Haskin of the League of Women Voters, Piscataway, NJ. Because of the time constraint, if you would summarize it would be helpful.

Ms. Haskin.

## STATEMENT OF PEGGY HASKIN, MEMBER, NATURAL RESOURCES COMMITTEE, LEAGUE OF WOMEN VOTERS OF NEW JERSEY

Ms. **Haskin**. Thank you very much, Senator Bradley, for giving the League an opportunity to testify this morning. I will not read my testimony. I would like to comment on the things that previous speakers have talked about.

Senator **Bradley**. That would be much appreciated.

Ms. **Haskin**. Well, there is an advantage to being last, because you can comment.

I wish to say that the League strongly supports the critical area program described by General Whipple. And incidentally, Manasquan Reservoir is going to start construction the 1st of October, and that will pull the pressure off of critical area number one.

The League is strongly supportive of the modification of the Francis E. Walter by the additional water from the Delaware River for New Jersey. As you know, the League is strongly supporting the alternatives, one of which is Francis E. Walter.

I would go to one part of my testimony. We are concerned about critical area number two, as I think I indicate, because the Delaware River water will be important for the ground water in southern New Jersey. Now, whether that water comes from Philadelphia or it comes from surface water intake in Beverley or someplace on the New Jersey side, it is still Delaware water, and it will not be available without Walter.

The League is strongly supporting the modification where users would pay for the water. We are, however, also concerned with farmland preservation to keep agriculture strong in New Jersey, and we would support Secretary Brown's proposal that the farmers be given some credit for providing recharge.

We think that is a reasonable suggestion, and I believe also I think Mr. Haines made a good point about that the cranberry growers are providing water for ground water recharge. And so I think all of those things should be taken into consideration.

One thing—and Don Vaupel and General Whipple may not agree with me, but if Delaware water is available to pull the pressure off the ground water in south Jersey, perhaps the Cohansey water, the ground water, could be perhaps more available to farmers and the public water supply than the Delaware River water. But that is just a thought.

I also believe—also, the League is very concerned about the development in south Jersey. South Jersey, as has been pointed out, depends heavily on ground water. And we are having a seminar, the League is, on October 9 called "Water for South Jersey: Looking at the Whole Picture."

Three of our speakers are here today speaking before you. But I would like to just mention what Don Vaupel said, and that is the whole purpose of our seminar. Really, when you use water you put a stress upon the system, and when you have a stress on the system you are going to get results and consequences.

And you have to be very sure that you know what you are doing so that the consequences are something you can live with. And so that is really one of the purposes of our seminar.

And I think that is all I can say.

[The prepared statement of Ms. Haskin follows:]

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TESTIMONY TO THE
UNITED STATES SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES
Presented by Peggy Haskin, Member, Natural Resources
Committee, LWVNJ at Burlington City, N.J. on September 14, 1987

Good morning. I am Peggy Haskin, a member of the Natural Resources Committee of the League of Women Voters of New Jersey. The League is a multi-issue, non-partisan, national citizen organization with a long-standing interest in environmental concerns.

The League presented testimony before this Committee two years ago at Cherry Hill, New Jersey. At that time we stated our belief that the New Jersey Department of Environmental Protection (DEP) was moving forward responsibly in the management of the water resources. We believe that this is still the case and that New Jersey is continuing to move forward in both developing and protecting its water resources.

This hearing deals primarily with ground water. DEP now has a number of programs underway to protect and maximize the ground water supply. We will discuss only one here. It has long been recognized that in many parts of the state more water is being withdrawn from the ground than is being replaced by rain or snowfall. In the last several years the State has moved to address the problem in a regulatory fashion. DEP has now established two so-called Critical Areas, where ground water is known to be overdrafted. Based on extensive data and analysis, large cutbacks on withdrawals have been required by DEP. The slack will be picked up either by an alternate water supply, generally surface water, or conservation -- or a combination of the two. Reducing the pressure on the ground water is designed to bring withdrawals into balance with recharge and thus maintain this valuable water supply as a renewable resource.

To date two Critical Areas have been established. Critical Area #1 includes parts of several counties - southern Middlesex, all of Monmouth and northern Ocean. Surface water will be the primary alternative for this area, with supplies coming from the Raritan system and the new Manasquan system.

Critical Area #2 encompasses a large area, including parts of Burlington, Camden, Gloucester, Ocean and Atlantic Counties. The major surface water supply to supplement the ground water in this area is the Delaware River. There is, however, a serious concern as to the amount of water available to New Jersey for this purpose. It depends largely on whether New Jersey decides to move forward on additional water supply in the Delaware River. This would be provided by enlargement of two Corps of Engineers' flood control dams in Pennsylvania - Francis E. Walter on the Lehigh River and Prompton on the Lackawaxen.

New Jersey is one of the four state members of the Delaware River Basin Commission (DRBC). In 1982 the four Governors and the Mayor of New York City signed an Interstate Water Management Agreement, known familiarly as the "Good Faith" Agreement. This Agreement is an alternate drought management plan designed to replace the previous plan dependent on the deferred Tocks Island Dam. The League believes that Tocks Island Dam should be deauthorized and supports major portions of the alternative "Good Faith" Agreement.

Under "Good Faith", in exchange for New York City's cutting back its export of water from the Delaware Basin during droughts, the three lower Basin governors agreed to enlarge the two flood control dams mentioned above. DRBC studies concluded that this action, together with strong conservation measures, would provide enough additional water to cover essential uses through the drought of record and still keep the "salt front" below the Camden well fields and the Philadelphia water intake.

"Good Faith" also mandated a Depletive Water Use Budget to prevent overallocation of the Basin's water resources -- i.e. keep a balance between supply and demand, while still maintaining water quality.

The Corps of Engineers has completed design, environmental impact analysis, permits, etc. to start the enlargement of Francis E. Walter Dam. A year ago Congress appropriated funds to start the construction. The Pennsylvania Legislature appropriated twelve million dollars for the recreation component of the project. However, nothing has happened due to the inability of the DRBC to guarantee the non-federal funding portion of the project.

In 1985 DRBC proposed that both the Walter and Prompton modifications be funded by user fees. In order to do this, a Federal Reservation to the Delaware River Basin Compact, added by Congress in 1961, has to be modified by Congress. Federal Reservation 15.1.b exempts all pre-Compact water users from charges. Only post-Compact users pay for their water - and they account for only 5% of the water used.

Legislation to modify the "grandfather" clause, 15.1.b, was introduced in the last Congress by Senator Bradley and Congressman Hughes. Unfortunately it was not enacted, due primarily to opposition from some now receiving costfree water. The League strongly supports this approach to funding new water projects. We believe that users should pay the true cost of a resource. We believe user charges will promote conservation and efficient use of water resources. We also support equity among users and believe that the present situation with only 5% paying and 95% receiving costfree water is highly inequitable and should be corrected.

DRBC funding to proceed with additional water supply for the Delaware Basin has not yet been resolved. Unless some solution is reached shortly Federal Funds for the Corps portion of the enlargement may go elsewhere. Although there is support for the modification of 15.1.b, particularly in New Jersey, no action has been taken. Some groups, including the League, are urging passage by Congress of legislation to modify the "grandfather" clause. Others claim that a portion of the additional water supply should be considered a "public good" and should be funded by the three Basin states - New Jersey, Pennsylvania and Delaware - rather than the users. Unless this impasse is resolved shortly, additional water supply may slip away. With a Depletive Water Use Budget in effect at DRBC, loss of additional water from Francis E. Walter could pose a major problem for management of South Jersey's ground water resources.

The President of the League of Women Voters of New Jersey, Dr. Susan S. Lederman, recently sent a letter to Governor Kean, the New Jersey Commissioner of the DRBC, assuring him of full League support for new Congressional legislation to modify the "grandfather" clause, 15.1.b. The League also wants to assure the Senate Subcommittee on Water and Power as well as other members of Congress of our full support for any new legislation that might be introduced to accomplish this.

We wish to reiterate that the League particularly admires the new Critical Area program, undertaken by New Jersey. We believe that it is a major step in preserving an essential water supply for those areas. We are concerned, however, about the future management of water supply resources in rapidly developing South Jersey, particularly if sufficient Delaware River water is not available.

To focus attention on the importance of taking into account the needs, the supply and the importance of environmental protection the League is sponsoring a seminar on October 9th at Cherry Hill on "Water for South Jersey - Looking at the Whole Picture". This seminar is having a panel of distinguished speakers to present all the issues. We hope that this may help provide the basis for optimum management of the resource. For your information, a program for the seminar is attached.

The question has been asked - "What can the Federal Government do to help New Jersey manage its water resources?" We urge Congressional support for the operations of the U.S. Geological Survey. Their studies in cooperation with various branches of our DEP have been invaluable in providing the necessary data for good management decisions. We understand that Federal funds have been cut for the geologic mapping program to assist the states. This service has been very important for New Jersey, and we request that you urge full funding for this cooperative program.

Thank you for this opportunity to present the League's support for some of the successful innovative approaches to water supply management in New Jersey and also to express some of our concerns about the future.

Senator BRADLEY. Thank you very much, Ms. Haskin, for your testimony. We appreciate your being here today.

Our last witness is certainly not least. He is a very important man in our State and has played from the beginning a decisive role in this unique Federal, State, and local cooperation which is the Pinelands National Reserve, the head of the Pinelands Commission, Terrence Moore.

Welcome, Terry, to the subcommittee.

## STATEMENT OF TERRENCE D. MOORE, EXECUTIVE DIRECTOR, THE NEW JERSEY PINELANDS COMMISSION

Mr. MOORE. Perhaps with that introduction, Senator, it would be best if I did not speak today. [Laughter.]

Senator BRADLEY. Well, no, we are always anxious to hear what you have to say.

We also want to thank you very much for the materials you provided the committee in advance on water supply in the Pinelands and the ecological implications of exporting water from the Cohansey documents, and the other documents I found extremely interesting.

Mr. MOORE. Thank you, Senator.

I understand that the last speaker before a subcommittee should be overwhelmingly impressive and brief, and I will be very, very brief.

Senator BRADLEY. I have read your statement and it was a brief statement to begin with, because it was backed up by voluminous information.

Mr. MOORE. Let me, if I may, touch on a couple of the issues. I think you are quite aware, Senator, of the very stringent environmental regulations affecting the New Jersey Pinelands. Many of those, in fact almost all of them, are very much based in the protection of water quality and particularly the very valuable resources that rely on the New Jersey Pinelands.

The Commission, as you know, has recently adopted a water policy statement with regard particularly to the Cohansey aquifer, and I think it is one that is going to the position of Mr. Haines and the previous speaker. And that is perhaps that the Cohansey aquifer is the last place which should be tapped as a water supply in New Jersey, unless the other alternatives are very much exhausted.

As you know, there are proposals to utilize at least minimally portions of the Cohansey aquifer. But I think that the Commission's policy asks some very simple questions, ones which are not just relevant to the State of New Jersey, but I think they are questions that must be asked in any water situation.

And that is, do we have the answer to what the impact of that withdrawal will be before we take the choice of utilizing those water supplies? That is a very brief summary of that policy, and I think it is one that the Commission debated very lengthily and came to a unanimous conclusion about.

Lastly, I would like to raise another issue that is related to water quality and water use. We are today dealing with a very important issue, but it is an element of perhaps a much larger issue that affects not only the State of New Jersey, but also the Nation as a whole.

What we have tended to do in the past in this State is to allow development to occur in a relatively uncontrolled manner, with an end rush at the last moment to find water, as we are doing now, to rectify perhaps the mistakes that were made.

I hope that your committee in looking at the issue of water supply and water quality might also turn its attention to the much larger issue that that is a part of, and that is land use, not only in the State of New Jersey but in the country; and that we avoid perhaps the problems by doing some deliberate and initial and up front planning of how our growth would occur so that our water resources, and indeed the protective measures that we take for water quality, will be in place before we allow the bulldozers to begin their construction activities.

I am hopeful that in New Jersey, particularly in the Pinelands, an example of how that has occurred is evident. And I think as the State moves into its own land use planning activities on the Commission, the State planning commission, that many of those problems and opportunities will become very evident as we go forward.

[The prepared statement of Mr. Moore follows:]

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STATEMENT OF
TERRENCE D. MOORE
EXECUTIVE DIRECTOR OF THE
NEW JERSEY PINELANDS COMMISSION
BEFORE THE
SENATE SUBCOMMITTEE ON WATER AND POWER

SEPTEMBER 14, 1987

Mr. Chairman and members of the Committee.

My name is Terrence D. Moore and I am the Executive Director of the New Jersey Pinelands Commission.

First, let me state that I welcome the opportunity to discuss with you issues affecting groundwater resources in the State of New Jersey. We are a state that has become keenly aware of the fragility of our groundwater in the last decade, and one which has learned difficult lessons from past neglect of our critical resources.

Ten miles to the east of our present location lies the 1.1 million acre Pinelands National Reserve, the largest body of protected open space between Richmond and Boston. This extensive land mass, one of New Jersey's best kept secrets, sits atop the exceptionally pure Cohansey and Kirkwood aquifers. The sandy soils of the Pinelands and the proximity of the Cohansey aquifer to the surface of the ground makes the area susceptible to the impacts of pollution in all forms.

In 1978 Congress, through the passage of Section 502 of the National Parks and Recreation Act, called upon the State of New Jersey to join the Federal Government in a unique partnership to preserve, protect, and enhance the internationally significant ecological resources of the newly designated Pinelands National Reserve. New Jersey responded to that invitation by enacting one of the most far reaching bodies of state land use legislation in the country today - the Pinelands Protection Act of 1979. A Comprehensive Management Plan was adopted by the Pinelands Commission for 22% of the State's land area in 1980, and approved by the Secretary of the Interior in January of 1981. Every application for development within the region, be it for a single family dwelling or a shopping center must meet the most stringent environmental standards in existence in the United States today.

The Comprehensive Management Plan sets forth a series of management area delineations for the region including a determination of the type and intensity of development permitted in each. These range from the very restrictive Preservation Area where little development opportunity is permitted to Regional Growth Areas where present and future development is being directed. The Pinelands Plan is quite simply a growth management program which respects in every sense the region's environmental resources.

A series of environmental standards guide development in the region. They are not set at a level that merely protects the public health. They are scientifically derived to protect the essential character of the Pinelands environment itself. Of particular relevance to this Committee's interests are the water quality standards that all development must meet within the Pinelands.

Nitrate/nitrogen, caused in large part by septic system effluent, is a major indicator of the continued purity of the aquifer systems beneath the Pinelands. Background levels of this pollutant range from .17 parts per million to 2 parts per million in the region. While federal and state potable water standards for this parameter are 10 parts per million, no development is permitted in the Pinelands that will exceed 2 parts per million nitrate/nitrogen. Indeed, in the most pristine areas of the Pinelands development densities are regulated in a manner so that the regional impact of development does not exceed .17 parts per million. Waste water treatment plants which are permitted only in the growth areas of the Pinelands must also achieve a 2 parts per million level of treatment. The standard addresses the ecological implications of development in the Pinelands, not just the potable water impacts. This is necessary because of the direct relationship between Pinelands water resources and the essence of the remaining Pinelands ecology.

It is estimated that the aquifers beneath the Pinelands contain 17 trillion gallons of water. As a potable water resource in an area of intense growth control, the aquifers remain susceptible to exploitation to quell the thirst of populations in rapidly growing regions of the state adjacent to the Pinelands. In these areas few development controls currently exist other than local zoning regulations.

I am submitting for the Committee's understanding of this problem two documents relating to a significant groundwater withdrawal issue affecting southern New Jersey. The first outlines the potential ramifications of such withdrawals on the Pinelands. The second is a recently adopted Pinelands Commission policy statement on the use of the Cohansey and Kirkwood aquifers.

This Committee is addressing a major problem facing the nation - the protection and wise utilization of its water resources. You have journeyed to New Jersey to gather information regarding the methods we are using, to address the issue here. Water quality protection and water resource allocation are important elements, but elements nevertheless, of a much larger policy issue which with few exceptions, has not yet been addressed at either federal or state levels of government. That larger policy issue is land use and the manner in which we match resources with necessary growth in our society.

Efforts such as the Pinelands National Reserve, which must be viewed as an experiment in growth management combined with resource protection, are important beginnings in a state and national land use policy debate. Here, water quality protection is part and parcel of a larger strategy aimed at making wiser decisions regarding the management of all resources within a region. Here, growth is channeled to areas capable of supporting new development.

I would hope that in this Committee's quest for information on water resource management and protection that it recognize the much larger need for intelligent land use policies in this nation. As a step in that direction, your work will indeed, be very beneficial to those who follow.

Thank you.

Senator **Bradley**. Mr. Moore, thank you. I would like to ask just a few questions.

In August 1987, the Pinelands Commission passed a resolution asking DEP for an analysis of any tapping of the Cohansey, and I am curious. What is the status of that?

Mr. **Moore**. It is a request that perhaps was reiterated under the Commission's policies. As I said before, we have not yet had a response. I think Mr. Vaupel in our previous discussions with USGS may also have an interest in terms of a lot of the activities that may occur.

The Department has not yet requested the U.S.G.S. to become involved in that study. There is a very significant financial issue of the cost of the study, and it is one of the least fed State agencies in dollar amounts of the State budget.

It does take a cooperative venture between the Department and the Commission and the U.S.G.S. to achieve that.

Senator **Bradley**. What would be the amount of the study?

Mr. **Moore**. It is very, very difficult to give you a final dollar amount, because no one has really done the outline of what the scope of the burden really would be for that.

There are some models that are available. It is a question of the adaptability of those models to this situation.

Senator **Bradley**. So the amount is? I did not catch it.

Mr. **Moore**. Millions. I do not have a complete dollar amount.

Senator **Bradley**. But it is much greater than the $200,000 study figure that was given earlier for additional work that the U.S.G.S. might be asked by the State to do?

Mr. **Moore**. Certainly, Mr. Vaupel can—and I am assuming that this is not a study that would be done in totality for the hundreds of thousands of acres of the State. It might go beyond that and provide you staff for the next 10 years.

Senator **Bradley**. But basically you would like the study to do what?

Mr. **Moore**. I think what we are interested in doing is to look at how water allocations out of the Cohansey aquifer would impact, first of all, our area of interest, the New Jersey Pinelands; and also those areas outside; and what are the long-term implications of those on the ecological wellbeing of the Pinelands and the entire environment.

The relationship between water and the Pinelands is something that is very clear and known. Withdrawals which may have a minimal impact may change very significantly the essential character of the Pinelands itself. The vegetation is very important and is dependent upon certain water quality and certain water levels.

Not knowing how the aquifer reacts to various types of drawdowns, we do not know what the impacts would be, and I think that is what we would have to find out to find out if indeed that water can be utilized.

I would be happy, Senator—by the way, we do have a generalized document that describes the study, and we would be very happy to transmit that to you.

Senator **Bradley**. I would welcome receiving it. Let me ask you also, on the water standards, particularly on nitrite, nitrate, and nitrogen, you have touched on that in your statement, that in the

Pinelands it is 17 hundredths parts per million up to 200 parts per million.

Mr. **Moore**. That is correct.

Senator **Bradley**. And the drinking water standard is 10 parts per million. So that gives some indication about the extent of the impurity of the water in the Cohansey.

Mr. **Moore**. Yes. And it also, I think, gives great weight to the stringent nature of how development is valued in the Pinelands, because we do not allow you to surpass the septic system.

And indeed, as was mentioned in the statement originally, in some locations the density of development that is provided on a region-wide basis. In New Jersey we have 10 parts, basically, on a .8 acre lot size, with the standard septic systems in the Pinelands. That would be a septic system of .32 acres.

Senator **Bradley**. So you have .32 acres per septic tank to get a standard of?

Mr. **Moore**. Of two parts. Under the dilution model that we have utilized, that would produce two parts. The .17 is produced by density allocation of development in certain areas of 17 units per square mile.

Senator **Bradley**. Could I ask you, have you had any noticeable increase in the number of people who visit the Pinelands?

Mr. **Moore**. We do have, and to some extent it has become a problem because, as you know, Senator, we do not have the appropriate facilities to receive people who come in. There is a great deal of concern by the property owners within the Pinelands about people who do come in—and it is predominantly privately owned land we are talking about—and trespassing does occur and vandalism does occur.

The Commission is very pleased to see your bill, which I would mention certainly before leaving here today, that would provide not only additional millions of dollars for acquisition, but also perhaps a place where people visiting the Pinelands might find out the intelligent manner that it should be utilized for recreation purposes.

Senator **Bradley**. So the Commission is supportive of the visitors center approach?

Mr. **Moore**. The Commission has had a lot of discussion, and it I believe supports the bill at this point in time. We hope we can provide testimony for this bill at the time it is brought before the Committee.

Senator **Bradley**. Well, on that note, Mr. Moore, I thank you very much for your testimony today. And I thank all the witnesses. This has been a very helpful hearing and it shows, I think, the diversity of our problem, as well as the diversity of our riches.

And it also shows the quality of the people who are dealing with this problem in our State. So I want to compliment all the witnesses, and the hearing will stand in recess.

[Whereupon, at 1:25 p.m., the hearing was adjourned.]

[Subsequent to the hearing the subcommittee received the following:]

State of New Jersey
DEPARTMENT OF THE TREASURY
OFFICE OF STATE PLANNING
150 WEST STATE STREET
CN 204
TRENTON, NEW JERSEY 08625

JOHN W. EPLING
DIRECTOR

HON. THOMAS H. KEAN
GOVERNOR

FEATHER O'CONNOR
STATE TREASURER

September 23, 1987

Senator Bill Bradley
Subcommittee on Water and Power
Room SD 364
Dirksen Building
Washington, D.C. 20510

Dear Senator Bradley:

I am writing to you upon the suggestion of your staff aide, Mr. Russell Brown. I am an Area Planning Manager with the New Jersey Office of State Planning. I only learned of your public hearing on Water Quality scheduled for September 14, 1987 in Burlington a few days before the hearing from a Commissioner of the New Jersey State Planning Commission. When I contacted Mr. Brown about testifying on behalf of the New Jersey State Planning Commission, he advised me that it was too late to be listed as a witness for the hearing. He instead suggested that I submit a statement in writing by September 28, 1987. Please have this correspondence serve that purpose.

Very briefly, the New Jersey Office of State Planning performs staff functions for the New Jersey State Planning Commission. Both entities were established by N.J.S.A. 52:18A-196 et seq. in January 1986. They were charged with devising a State Development and Redevelopment Plan which would conserve the state's natural resources, protect the quality of its environment, revitalize the state's urban centers, while also promoting the economic health of the state along with needed housing and public services at a reasonable cost. Concern for the preservation of the state's water quality is of course included in that legislative mandate.

Mr. Brown suggested that the Office of State Planning and the State Planning Commission could be most helpful in providing guidance as to what the appropriate role for the Federal government might be with respect to the preservation and maintenance of water quality in the state. While the preservation and maintenance of water quality are of obvious and important concern to the Office of State Planning and the State Planning Commission, we are currently in the midst of our planning process which will ultimately lead to a statewide plan providing guidelines for future state development and redevelopment through 2010. Consequently, it would be premature and imprudent to suggest a set of federal policy proposals at this time.

Nevertheless, at a minimum, Planning Staff has suggested that the Federal government might perform a very important policy research and coordinating role. The Federal government might more aggressively fund important policy research related to water quality. It can also perform a vital role in coordinating the collection and dissemination of information in this regard. Water resources require addressing not just water quality per se, but also related issues which are necessarily regional in nature. The Federal government can provide the impetus for such regional conversation and coordination.

Moreover, the State Planning Process as mandated by its enacted legislation requires a "cross-acceptance" process that involves the coordination of state, county, and local planning agencies. Through this "cross-acceptance" process as well as the legislatively mandated three year review and revision of the State Plan, the Office of State Planning and State Planning Commission will be instrumental in providing the federal government with valuable updated information on the conditions of water quality and the effects of changing land use patterns on water quality throughout the state on a level of rare detail.

I trust that this correspondence will be only the first of numerous communications between the New Jersey State Planning Commission, the Office of State Planning and your Subcommittee. I also trust that you will keep us informed of any additional hearings and/or business of your subcommittee which bears on the mission of this Office.

Thank you for you kind attention to these matters.

Very truly yours,

Martin A. Bierbaum
Area Planning Manager
Office of State Planning

cc: John W. Epling, Director, Office of State Planning
Candace Ashmun, State Planning Commission
Terrence Moore, Executive Director, Pinelands Commission

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